Appendix B

Farmer Breakfast and field day announcements and notes

ARE YOU TIRED OF HIGH CHEMICAL BILLS?

BASIC (Biological Agriculture Systems In Cotton) would like to provide you with **FREE** information and a **FREE** breakfast. In addition to an informative presentation by **Ralph Jurgens** of **New Era Farm Service** on the principles of soil fertility.

When: **Thursday, February 20**
8:00 a.m.

Where: **Eagles Nest Restaurant**
2000 E. Childs Avenue
Merced, CA 95340
(209) 723-1041
(Exit Childs Avenue from Hwy 99. Next to the Ramada Inn.)

RSVP for breakfast to: Julie Parker at (209) 665-3925

BASIC
Biological Agriculture Systems In Cotton
Sustainable Cotton Project
23199 Road 7, Suite B
Chowchilla, CA 93610

A **FREE** breakfast and **FREE** information which will enable you to **SAVE $$$$** and reduce your chemical costs. Plus, a presentation by **Ralph Jurgens** of **New Era Farm Service** on the Principles of Soil Fertility.

Ed Roberts, PCA, Crop Monitor, and Ralph Jurgens, Agronomist and Nutritional Consultant, will present Baseline Monitoring Techniques for Biological Cotton Production.

When: **Thursday, March 27**
8:00 a.m. - 10:00 a.m.

Where: **Los Tejanos Restaurant**
230 E. Robertson Blvd.
Chowchilla, CA 93610
(209) 665-4746
(Take Chowchilla Exit from Hwy 99. Turn right. Restaurant is behind the gas station on the right.)

Biological Agricultural Systems In Cotton (BASIC) strives to assist growers in cost effective alternative methods of farming in a world of increasing costs and regulations.

1.5 DPR credits and 2.0 CCA credits are available.
RSVP for breakfast to: Julie Parker at (209) 665-3925

Sean Swezey, UC Specialist & Polly Goldman, Graduate Researcher, UC Santa Cruz, CASFS, will present BASIC Production Statistics for 1996.

When: **Friday, May 30**
8:00 a.m. - 10:00 a.m.

Where: **Los Tejanos Restaurant**
230 E. Robertson Blvd.
Chowchilla, CA 93610
(209) 665-4746
(Take Chowchilla Exit from Hwy 99. Turn right. Restaurant is behind the gas station on the right.)

Biological Agricultural Systems In Cotton (BASIC) strives to assist growers in cost effective alternative methods of farming in a world of increasing costs and regulations.

2.0 DPR credits and 2.0 CCA credits are available.
RSVP for breakfast to: Julie Parker at (209) 665-3925

B A S I C

Biological Agriculture Systems In Cotton

Printed on Recycled Paper

23199 Road 7 Suite B
Chowchilla, CA 93610

email: BASIC96@aol.com

Telephone (209) 665-3925
Fax (209) 665-3916

SUMMER FIELD DAY!!

Date: **Friday, June 27, 1997**
Time: **9:00 a.m. to 3:30 p.m.**

Schedule of Events

8:30 a.m. **Sign in at:**
C & M Organic Enterprises, Inc.
23199 Road 7, Suite B
Chowchilla, CA 93610

9:00 a.m. **Welcome and Introduction**
Linda Sheppard
BASIC Program Coordinator
Chowchilla, California

9:30 a.m. **1st Farm Tour ~ *Cornaggia Farms***

Pete Cornaggia, Jr. is a third generation farmer who has been farming without the aid of pesticides for the past five years. Pete has never liked the idea of using chemicals and has only sprayed organic materials when absolutely necessary.

Flaming Cultivator ~ In Field Demonstration
Dr. Tim Prather
UC Statewide IPM Project
Parlier, California

Cotton Plant Development & Insect Pressure Update
Pete Goodell
UC - IPM Specialist, Kearney Agricultural Center
Parlier, California

In Field WorkGroup Sessions:

Beneficial Insect Recognition & Identification
Dr. Sean Swezey
Specialist, UCSC, CASFS
Santa Cruz, California

Nutrient Deficiencies & Plant Physiology
Ralph Jurgens
New Era Farm Service
Tulare, California

12:00 noon **LUNCH PROVIDED AT SHEPPARD FARMS**

1:00 p.m. **Biocontrol Agents in Cotton: Can We fulfill this potential?**

Dr. Daniel Gonzalez
Department of Entomology, UC Riverside
Riverside, California

1:45 p.m. **2nd Farm Tour ~ *Sheppard Farms, Inc.***

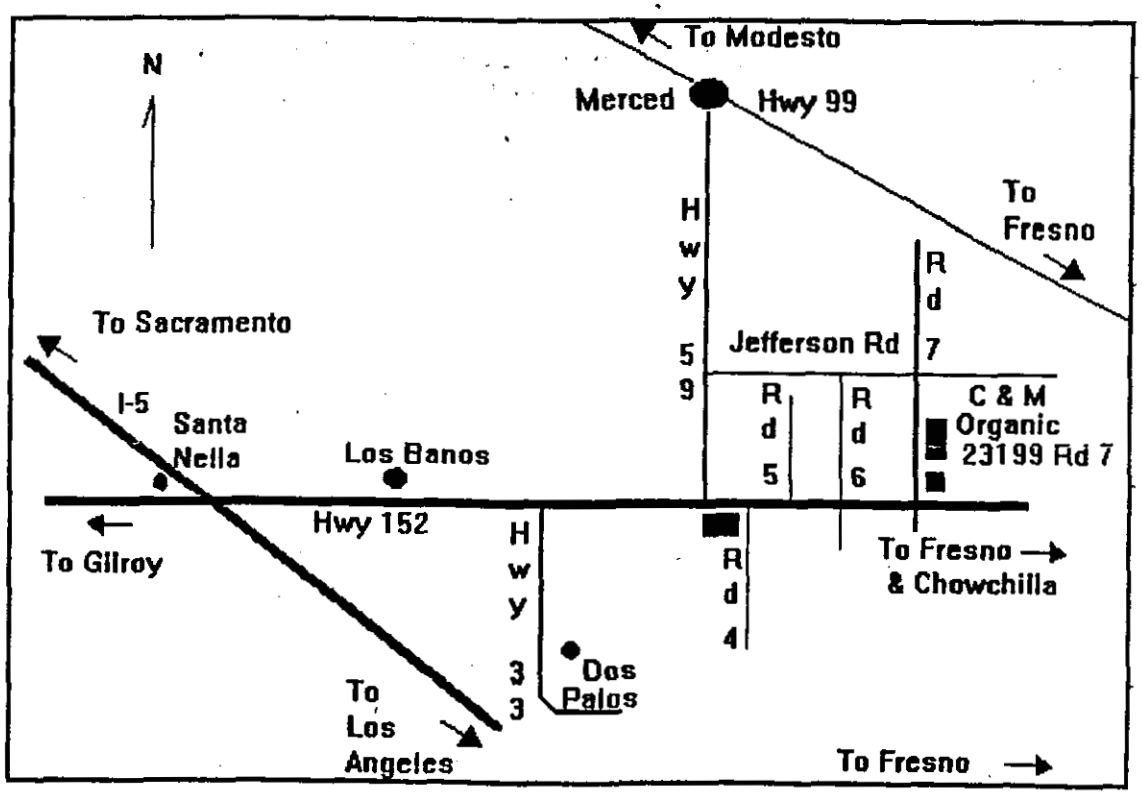
Claude and Linda Sheppard's farm has been owned and farmed by Claude's family for three generations. They maintain approximately 880 acres of Certified Organic cotton, vegetables, and other field crops using biological controls and beneficial insects to regulate their pest pressures.

2:30 p.m. **Marketing Strategies**

Ed Davis
S & E Organic Farms, Inc.
Bakersfield, California

3:15 p.m. **Conclusion and Thank You**

Will Allen & Linda Sheppard



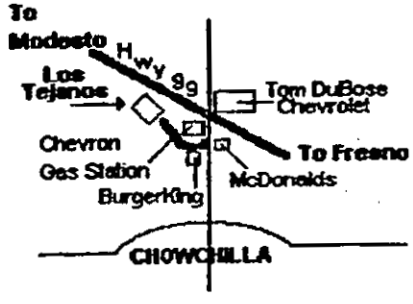
4.0 PCA and CCA Credits Available

For RSVP and information on local accommodations, please call (209) 665-3925.

Sponsored By: The Sustainable Cotton Project and the US EPA.
Printed on Recycled Paper

FREE LUNCHEON PROVIDED AT:

LOS TEJANOS RESTAURANT
230 E. Robertson Blvd.
Chowchilla, California



Menu

Buffet Luncheon

Cheese Enchiladas
Meat Enchiladas
Beans
Rice
Macaroni Salad
Potato Salad
Green Salad
Coffee, Tea or Soda

DPR & CCA CREDITS WILL BE GIVEN

Please RSVP to (209) 665-3925 ASAP.

Sustainable Cotton Project
BASIC
Biological Agriculture Systems In Cotton
23199 Road 7, Unit B
Chowchilla, CA 93610

Sept. 1997

BASIC

Biological Agriculture Systems In Cotton

PRESENTS:

THE SECOND ANNUAL

FALL FIELD DAY

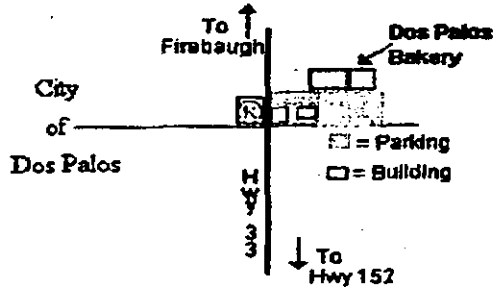
- FIELD TOURS
  - ~ Conventional/BASIC first year field
  - ~ Certified Organic BASIC field
- GUEST SPEAKERS
  - ~ **Claude Sheppard**
    C & M Organic Enterprises, Inc.
  - ~ **Sean Swezey**
    UC Santa Cruz
  - ~ **Tim Prather**
    UC Statewide IPM Project
- MID-SEASON PLANT AND INSECT UPDATE
- FLAMING CULTIVATOR FIELD TEST RESULTS

Tuesday, September 23, 1997

DPR & CCA CREDITS AVAILABLE

8:00 a.m. SIGN - IN AT:

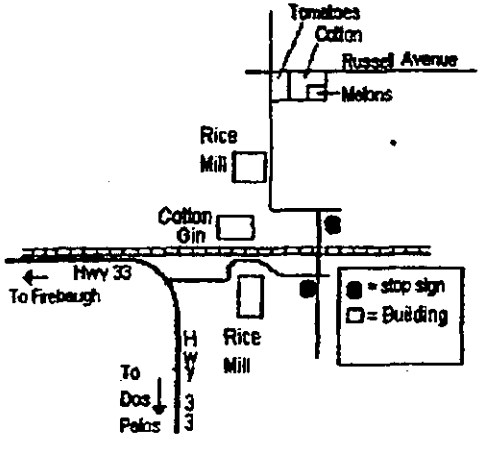
Dos Palos Bakery-Parking Lot
SW Corner Hwy 33/Center St.
Dos Palos, California



DIRECTIONS:

Take Hwy 152 to Dos Palos/Hwy 33 exit. Follow Hwy 33 South until you reach a stoplight (in Dos Palos). Bakery is located next to grocery store in small shopping center on SW corner behind Exxon gas station and Butch's Drive-in.

8:30 a.m. (sharp!) DEPART TO FIRST FIELD.



DIRECTIONS:

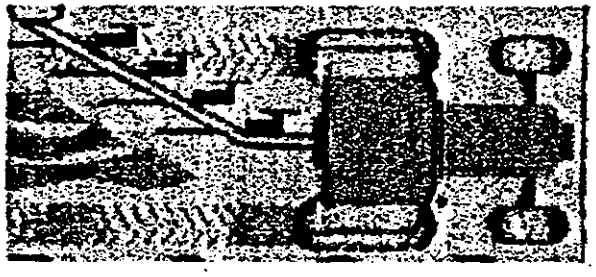
Take Hwy 33 South to , turn right (west). Follow to stop sign, (in South Dos Palos), turn left (south). Go across RR tracks to next stop sign, turn left (Russell Ave). Follow this road. After it curves to the right you will drive approximately miles to . We're There!

9:00 a.m. FIELD TOUR

Mike Best Farms

Mike Best read about BASIC in a cotton magazine last year and decided to give it a try. His spray bills had been rising for the past few years, while his yields remained unchanged and lower than he preferred. Hear about what Mike has learned this year using biological practices.

10:00 a.m. DEPART MIKE BEST FARMS



11:00 a.m. CROP STOP

The Fruits of Labor

A brief stop at a "sea of organic cotton", ready to harvest, at Sheppard Farms. UC Specialist, Sean Swezey will present an update on crop progress and pest pressure. There will also be a brief demonstration of how the cotton is harvested.

11:30 a.m. DEPART TO CHOWCHILLA FOR LUNCH

12:00 p.m. LUNCH

MEXICAN BUFFET LUNCHEON
PROVIDED BY B A S I C

(Menu provided on back.)

1:30 p.m. FLAME CULTIVATOR

Dr. Tim Prather
UC STATEWIDE IPM
Parlier, California

A presentation based on some of the early results of field tests conducted in various BASIC fields using a flaming cultivator for weed control. In addition to statistics on weed control, Dr. Prather will also discuss the effects of flame cultivation on plant growth and beneficial populations in the fields.

2:30 p.m. CONCLUSION & THANK YOU

Linda Sheppard
B A S I C
Program Coordinator

For additional information, contact B A S I C Assistant Coordinator, Julie Parker at (209) 665-3925.

BASIC

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23199 Road 7 Suite B
Chowchilla, CA 93610

E-mail: BASIC96@aol.com

Fax (209) 665-3916
Telephone (209) 665-3925

Meeting Minutes

February 27, 1997
Los Tejanos Restaurant
Chowchilla, California

Present: Ralph Jurgens, Agronomist, New Era Farm Service; Joann Baumgartner, BASIC & SCP; Warren Sargent, Ag Attack; Ken Van Loebensels, Bowles Farming Co.; Sam Earnshaw, CAFF & Farmer; Malia Oliver, NRCS-Merced; Stephen Sheppard, BASIC; Pete Cornaggia, Jr., BASIC grower; Polly Goldman, UC Santa Cruz; Joe Grillo, USDA FSA; Chris Keeler, Merced FSA; Casey Van Rys, Farmer; Rod Meadows, Crop Monitor; Shawn Del Moss, BASIC grower; Jeff Ross, Farmer; Julie Parker, BASIC; Ed Roberts, Crop Monitor; Claude Sheppard, Sheppard Farms; Linda Sheppard, BASIC; and Sean Swezey, UC Santa Cruz.

Coordinator Linda Sheppard welcomed everyone and introductions were made round the room. Linda then gave a brief summary of the BASIC project and its goals. She reaffirmed the BASIC belief that a grower need not be organic to be in the program, and continued to explain that BASIC strives to educate growers involved in all areas of cotton farming on alternative techniques available to reduce chemical use in cotton, usually at a savings to the grower. She explained how Sheppard Farms has been involved in various trials and research conducted on their farm, and relayed their plans to conduct trials on flame cultivation during the 1997 crop year, along with other BASIC growers like Pete Cornaggia, Jr. Linda continued to describe how Sheppard Farms has used a modified tobacco topper in previous years to regulate growth in their fields and stated that the topped would be available for service to anyone wishing to try this technique in place of PIX.

Next Linda outlined the Integrated Pest Management program they have had so much success with and informed the group that this would be their 10th year without pesticides, and that a survey conducted by their gin in 1996 showed their yields to be in line with the county averages. She described a severe mite problem encountered in their fields during 1996, which was handled strictly with beneficial releases and resulted in yields slightly under 2 bales per acre. Linda then stressed the need for patience with the IPM program and explained that the natural balance of beneficials and pests will maintain any problems which may occur and that as the year progresses, growers involved in an IPM will see nature at work; if the pest pressures rise, the beneficials compensate and maintain the pressure, and the best part is the fact that you can walk out into your field at any given time to check on your crop with no concern for residues and toxicity. Linda concluded by stating that 10 years of records from Sheppard Farms reflect the success of an IPM program that works and can bring satisfaction to those who choose to participate in it. With that Linda suggested that the group order their breakfasts and briefly outlined the remainder of the meeting and introduced the speakers -- Sean Swezey, UC Specialist, CASFS, UC Santa Cruz and Ralph Jurgens, Agronomist, New Era Farm Supply Tulare, California.

Sean Swezey began by relating his background and specifying some of the studies which have and are being conducted through his facility. He described the numerous cotton varieties he has studied and the diversity of farming systems he has seen, with the most precise, varietal, and technological being done within

California, especially in Merced and Madera Counties. Sean then characterized the ongoing conversion study which details a three year study of conversion to organic farming and stated that the results and conclusions were completed and would be available through the BASIC office.

Next Sean described the BASIC program and how the original idea for BASIC was formed. He stated that the fields would preferably have several ideal situation, such as to have had a sellable crop in the previous year, which was comparable with county averages. This field would be matched with a non-IPM or conventional grower for comparison. The fields would be walked every week, with petiole samples be taken at appropriate intervals throughout the season. The grower would agree to forego preplant applications of herbicides or early sidedress without a documented need from a concerned PCA and attempt to maintain environmental conservation for as long as possible. In addition, a BASIC grower will initiate an IPM program in the participating field and attempt to become as actively involved in monitoring the field as possible. Sean explained that cotton has the largest number of natural enemies of any crop except alfalfa in the Merced/Madera County region and that many specialists in agriculture, including the University of California, actually are presenting guidelines to follow in relation to the acceptable number of pests in a given field under specific conditions.

Plant mapping is another research service provided by BASIC at no charge to the grower. A limited number of plants are removed from the field and are then measured and compared to predict plant voracity, growth regulation, fruit retention, cutout date, etc. with the grower advised of plant condition continuously through the growing season. The final preference for a BASIC field is a proximity to alfalfa. Alfalfa is desired because it tends to be an immense source of beneficials within the Merced/Madera County region and offers an alternative to cotton for lygus and thrip as well. With that Sean informed the group that BASIC was enrolling new fields into the program at this time with monitoring and plant density measurements beginning in late April or early May, and should anyone wish to obtain more information or enroll, they could contact the BASIC office or speak to any member of the BASIC team after the meeting.

The next speaker on the agenda was Ralph Jurgens, Agronomist, of New Era Farm Service, a 21 year sales and consulting service in the Visalia/Tulare area. Ralph specializes in plant nutrition and deals specifically with consulting in integrated sustainable farming systems. The approach introduced by Ralph and New Era is based on systems, not products--nutritional systems which help support the mechanism within the plant itself.

Ralph explained how maintaining good plant nutrition is an integral part of avoiding disease and insect attack in any crop. He stated that N P K and Zinc are important in maintaining goo plant nutrition, however overfertilization with these elements can create unfavorable conditions within the field which can result in square loss, and decreased boll retention. Ralph proceeded with an excellent slide show which did not receive just from the lighting situation, but resulted in an excellent presentation nonetheless. Ralph showed several different growers with diversified techniques and stressed the importance of building soil structure, not only by adding elements to the soil, but by rotating crops. In addition, crop rotation can provide an important element of integrated pest management by creating habitats for the beneficials to live and repopulate.

Next Ralph described how the basis to understanding soil is air, water, mineral, living organisms and organic matter content. Air and moisture relationship is critical in maintaining good soil nutrition. In systems which are unable to maintain the balance of air and moisture through synthetics, this balance is even more critical. The living organisms transform minerals and other elements into humus and humic acids. Should the balance become unevenly distributed, many areas of plant development are affected. These areas can include nutrient uptake, square and boll retention, plant growth, releasing nutrients and fighting pests and diseases. The most typical scenario in the Visalia/Tulare area is applications of manures at 10 to 15 yards per acre, whereas alternative systems apply a considerably reduced precision application of composts at 2 to 5 tons per acre. This application will precede bed preparation and is recommended during the winter months.

Ralph then discussed the importance of soil samples being pulled on the fields prior to fertilization of any kind. He explained how individual nutrients affected the crop and how relatively cheap it was to correct the situation without adding additional elements which can create further imbalances. These imbalances can result in soil compaction, diseases, pest damage, low oxygen, acidity, etc. and when nutrients come into contact with each other they can stimulate or depress plant uptake. He stressed the need for growers to know their soil structure and be involved in all areas of crop production. Ralph stated that one of the most important combinations is the ratio between calcium and magnesium. Should these two elements become out of balance, the soil will have a tendency to become heavy and seal, thereby cutting of the oxygen to the plant and the microorganisms which promote growth. Excess Phosphorus is another concern mainly because of its tendency to accumulate, not only in the soil, but specifically around the root zone of the plant. This, too is monitored with the use of soil and petiole testing.

Ralph next described how excess nitrogen can inhibit potassium, calcium, magnesium, zinc, and boron within the physiology of the plant. Ideally, if all the nutrients in the soil were balanced, all the nutrients in the plants would be balanced. Unfortunately, the majority of the tests received by Ralph are not balanced, and usually reflect over-fertilization of the soil with one nutrient or another. This usually occurs in systems which focus specifically on N-P-K and zinc and tend not to look at the other elements which facilitate the uptake of N-P-K and zinc. However, Ralph states that it is important to consider all the necessary elements and their balance in the soil. Since any one element can affect another both positively and negatively, close monitoring and consideration of soil nutrition should be considered a necessity in farming. He related how high nitrogen levels can stimulate magnesium uptake in cotton, but if excessive it stimulates magnesium uptake and "pushes down" calcium, potassium, zinc, some manganese, iron, and boron. The decrease in these nutrients, especially calcium and potassium can result in excess shedding and additional mite infestations, and in fact, potassium deficiencies will almost always result in immediate infestation of pests. Overfertilization of phosphates can also stimulate calcium uptake in the plant or depress calcium uptake in the plant, dependent on the balance of additional elements in the soil, also resulting in shedding and heightened pest pressures.

Ralph continued to describe how different levels of nutrients and other elements within the soil affect each other, plant development, and yields. He outlined the various systems utilized by his firm and the relatively low cost involved in their use (on average the cost for the entire crop was between $10 and $12 per acre). These systems are available for citrus, almonds and other crops, as well as cotton. Ralph included slide pictures of cotton experiencing various stages of nutrient levels, including potassium and phosphate deficiencies at various stages and excesses of magnesium, and nitrogen.

Ralph also touched on the importance of integrated pest management and habitat management. He then detailed the status of some of his current research projects involving specific nutrients, such as calcium, and how the proper balance of nutrients can stimulate the plant into producing strong and more resilient cell walls and membrane covers to keep pests from attacking and damaging the plant.

Ralph next talked about the differences between manures, composts and bio-solids, giving analysis results for each for the growers to consider. He also presented each person in attendance with an info guide which contains all of the information found in his presentation. He did, however explain that New Era did not utilize bio-solids without first exposing them to excess heat because of the presence of E-coli bacteria in every sample taken from the bio-solids upon their arrival at New Era. Ralph then concluded his presentation and returned the floor to Linda Sheppard.

Linda then thanked the group and invited everyone to the next meeting which would be at Los Tejanos Restaurant in Chowchilla on Thursday, March 27, 1997 at 8:00 a.m.

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Fax (209) 665-3916

Meeting Minutes

March 27, 1997
Los Tejanos Restaurant
Chowchilla, California

Present: Joe Hautszinger, American BioDynamics; Rod Meadows, Crop Monitor; Julie Parker, BASIC; Polly Goldman, UC Santa Cruz & BASIC; Joann Baumgartner, BASIC & SCP; Sean Swezey, UC Santa Cruz & BASIC; Warren Sargent, Ag Attack; Ralph Jurgens, Agronomist, New Era Farm Service; Claudie Wiggins, Farmer; Raymond Sheppard, Farmer; Pete Cornaggia, Jr., BASIC grower; Ed Roberts, Crop Monitor; Claude Sheppard, Sheppard Farms; Linda Sheppard, BASIC; and Augie Feder, US EPA.

Coordinator Linda Sheppard welcomed everyone and introductions were made round the room. Linda then announced that due to technical difficulties, the minutes from the February meeting were not available, but would be at a later date. She also informed everyone that, contrary to the newsletter, the next BASIC meeting would not be in January, but April 24, 1997.

Linda then introduced Ralph Jurgens, Agronomist, who reviewed soil analyses for three of the BASIC grower consultants; Shawn Moss, Claude Sheppard, and Pete Cornaggia, Jr. This was done as a demonstration of the type of analysis and recommendations BASIC growers can expect to receive. The remaining BASIC growers will be handled on a one-to-one basis and/or with a taped copy of the recommendations. In general, Ralph stated that he was amazed at how low the sodium appeared and the almost perfection of PH balance shown on the soil analyses. He informed Claude that his soil actually had the potential to produce exceptional crops, especially vegetables. He did state, though, that a slight application or two throughout the year will probably be needed to keep the soil at good levels of nutrition. Ralph explained that on one of his growers, they had applied manganese sulfate at a rate of 25 lbs. per acre and it increased the grower's yield by 212 lb.. per acre. He added that boron is important in this area as well because it stimulates the uptake of magnesium and improves square and boll retention.

For Pete Cornaggia, Jr., Ralph stated that his field had more acid and lower calcium in relation to magnesium, which stimulates nitrogen uptake and tends to make the plants lush to the point of rankness. This in turn makes it difficult for the bolls to set because the plant remains in a vegetative state rather than moving into a fruiting state. Ralph suggested adding calcium and boron to Pete's fields along with some other elements to balance the nutrient levels within his field.

Ralph next reviewed the sample taken from the field of Shawn Moss. Ralph stated that Shawn's field shown a need for improvement in some areas, especially calcium and magnesium. He did add, though, that since Shawn had not used any type of fertilizer in the previous year, there were not as many problems as he would have expected. He continued to say that the cost to correct these projects could run between $8.00 and $20.00 per acre for the entire crop year, and he actually suggested that this is justified economically by reducing the compost or manures applied from 15 yd/ac to 2 yd/ac.

Ed Roberts next presented an interesting overview of possible pest pressures in cotton and the outlook for 1997. Ed began by agreeing with Ralph about the need for health plants and the importance for providing proper nutrients to the crop. He continued to describe how the aphid in the wheat seems to be higher this year than he has seen in the past ten years. Normally a high wheat aphid reflects a low cotton aphid year, but we'll have to wait and see. The beneficials in the fields seem to consist mainly of spiders and ladybugs. The lacewings don't seem to have been built up yet this spring, but Ed said he would keep us informed. Linda stated that she was aware of several very late wheat fields and asked if this would help keep these aphids away from the cotton; Ed stated that this was a possibility, but we would have to watch closely and see. Ed explained that any pest damage sustained by young cotton is usually only temporary because the plant compensates for the damage at a later growing stage, so the concern for the young cotton is minimal at this time. Sean Swezey added that a major benefit for this year's growers is the fact that the cotton has been planted and is up early, which tends to keep the crop ahead of the pests, based upon previous year's data.

Next Linda introduced Joe Hautszinger of American BioDynamics in Boise, Idaho, who introduced a product he is conducting trials on to achieve EPA approval. The product is a garlic spray, used primarily as a systemic miticide. The product is introduced into the root zone during various stages of growth, and taken up into the plant, making it taste like garlic to pests (which they don't like). This, in turn causes the pests to leave, without damaging the beneficials. Joe did state, however, that he suggests a light miticide application included with the garlic spray to maximize the effect and the kill. He offered several gallons for test acreages should anyone desire to try the product and several growers expressed their interest. We will attempt to provide the results of the test at a future date.

With that Linda thanked everyone for attending and announced that the April meeting will be held at Los Tejanos in Chowchilla again for breakfast on Thursday, April 24, 1997 at 8:00 a.m.

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Chowchilla, CA 93610

E-mail: BASIC96@aol.com

Fax (209) 665-3916
Telephone (209) 665-3925

Meeting Minutes

April 24, 1997
Los Tejanos Restaurant
Chowchilla, California

Present: Will Allen, BASIC & SCP, Joann Baumgartner, BASIC & SCP, Pete Cornaggia, Jr., BASIC grower; Frank Cross, BASIC grower, Rod Meadows, Crop Monitor; Shawn Del Moss, BASIC grower; Julie Parker, BASIC; Ralph Piedrafita, grower, Ed Roberts, Crop Monitor; Claude Sheppard, Sheppard Farms; Linda Sheppard, BASIC; Stephen Sheppard, BASIC and Sheppard Farms, Ross Smith, PCA with BioSmyth of Merced, California, Sean Swezey, UC Santa Cruz, and Claudie Wiggins, BASIC grower.

The meeting began with everyone introducing themselves to the group and ordering breakfast. During the repast, the group watched a video on flame cultivation supplied by FLAME Engineering, Inc. of La Crosse, Kansas. Dr. Sean Swezey informed the group that Pete Cornaggia, Jr. had agreed to participate in some field trials in flame cultivation under the supervision of Dr. Tim Prather, Statewide IPM Project Weed Management Specialist, UC Cooperative Extension. Sean added that any other grower interested in participating in these trials should contact the BASIC office at (209) 665-3925.

Following the flame cultivation film, Dr. Swezey gave a brief but informative overview of the 1996 BASIC year, including production costs, as well as our plans for BASIC in 1997. He explained that there was basically no difference in average yields when comparing the 1996 conventional growers with the 1996 BASIC growers, with both types of growers averaging approximately 2 - 2 1/2 bales per acre. Sean explained that the elements of BASIC include

A. A good number of growers involved who are searching to be as efficient as they possibly can with all their chemicals and all their costs. BASIC strives to present new and updated information to its growers so to provide them with as many tools as possible to help them achieve those goals.

B. A bi-level program involving Phase I growers(IPM use) and Phase II growers (Biological, Transitional or Organic farming practices) which offers several approaches to chemical and cost reduction without biases caused by program "labels" such as Phase I and Phase II. BASIC recognizes and respects each grower as a grower and nothing else. Alternative methods are offered as options to spraying for the growers, with background, instructional, and "in-field" trials to assist in them with their crops.

Shawn stated that the bottom line for last year's cotton was that everyone got "paid" for their work, and the BASIC projects seemed to assist with the reductions as predicted. This year, BASIC will travel even further into Biological Agriculture Systems In Cotton by conducting trials on various fertility programs, products, and equipment, such as the flaming cultivator.

Sean explained how BASIC doesn't have to prove anything to the world at large until we do it. So, when we attempt different strategies, we do them based on our own observations and ideas, but at a degree that everyone can understand, enabling them to utilize the strategy to their best interests. He continued to explain

how the growing conditions in the San Joaquin Valley are unique to this area, with alfalfa near or adjacent to most cotton fields and an excellent weather pattern to carry it through the season.

Sean illuminated the workings of BASIC by explaining how each facet of the project relies on the other to either conduct, retrieve, document, present, and at times, receive on behalf of the BASIC program, and that without teamwork, without the efforts of any one person, the BASIC program would not survive.

BASIC growers are not forced to attend meetings and any information missed can be retrieved through Julie Parker at the BASIC office in Chowchilla at (209) 665-3925.

Sean complimented Julie for her work on the BASIC newsletters and minutes, and stated that he is actually receiving calls from all of the world, including Africa, Peru, and even Vietnam, requesting more information about BASIC and copies of its literature. Of course, these calls are forwarded to Julie for assistance.

Sean explained that plant mapping will be continuing this year, with a direct computer link in the field to help produce mapping information at a much faster rate and get the information to the growers within 2-3 days. This will assist growers in making decisions which will affect their crops, like irrigation, health, fertility and fruit retention, growth regulation, cut out, etc.

Sean then recounted how BASIC and conventional growers averaged identical top boll retention, first boll positions, and other important factors, while showing less bottom retention, but taller plants. He explained how a deficit in one area is compensated for in another, with all growers averaging 2 - 2 1/2 bales per acre in each group.

Next Sean touched on the beneficial releases and their success in 1996. He explained that this program, too seems to be achieving goals for growers as they put it to use. Although, graphically the conventional growers showed less pests than the BASIC growers, the BASIC growers kept pest populations in check with no loss of yields and a reduction in pesticides and costs. He continued to explain that BASIC plans to mark and monitor lygus interaction between alfalfa and cotton fields. In this way we can determine the patterns and lifestyles of lygus to aid in combating future migrations into the cotton and to demonstrate the importance of alfalfa nearby as a necessary element of cotton production.

With that Linda thanked Sean for his presentation and the meeting was adjourned to a general discussion.

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Biological Agriculture Systems In Cotton

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MEETING MINUTES

May 30, 1997
Los Tejanos Restaurant
Chowchilla, California

Present: Will Allen, SCP & BASIC; JoAnn Baumgartner, SCP & BASIC; Jennifer Charles, UC Santa Cruz; Eddie DeAnda, SCP; Polly Goldman, UC Santa Cruz; Joe Grillo, Madera FSA; Ralph Jurgens, New Era Farm Service; Rod Meadows, Crop Monitor & BASIC; Julie Parker, BASIC & Sheppard Farms; Ed Roberts, Crop Monitor; Warren Sargent, Ag Attack; Jacob Schuh, Jr., Triple S Farms; Claude Sheppard, Sheppard Farms & BASIC; Linda Sheppard, Sheppard Farms & BASIC; Raymond Sheppard, farmer; Stephen Sheppard, BASIC & Sheppard Farms; Ross Smith, Bio Smith Pest Management; Sean Swezey, UC Santa Cruz; Kerry Washinko, Madera County BIOS Coordinator; and Claudie Wiggins, farmer.

The May BASIC meeting was called to order by Program Coordinator Linda Sheppard, who welcomed everyone and announced the upcoming Summer Field Day had been scheduled for Friday, June 27th from 8:30 a.m. to 3:00 p.m., beginning at C & M Organic Enterprises, 23199 Road 7, Chowchilla, California. Next Linda requested everyone introduce themselves around the room and then place their breakfast orders with the waitress.

Once everyone had received their orders, Linda introduced Dr. Sean Swezey, Specialist, UC Santa Cruz, Center for Agroecology and Sustainable Food Systems, who offered a brief summation of the 1996 "in field" results, previously addressed at the February BASIC meeting, and transitioned into an educational outline and slide presentation some of the economics of the 1996 BASIC program.

Dr. Swezey began by recognizing the efforts of graduate research assistant, Polly Goldman, who invested many long hours into the research and compilation of the economic information used in this program. He then outlined some of the components of the BASIC program, such as the ability for organic and non-organic farming to be competitive within the cotton market, as well as the preliminary production and harvest costs per acre. Sean explained that the final report will be submitted to the Department of Pesticide Regulation at the California Department of Food and Agriculture, who funds the research of Sean and Polly, through the IPM Innovators Program. He continued to explain that all the initial information is supplied by participating growers under a format designed to keep the growers' identities and individual information anonymous in order to maintain a constant throughout the project. Sean also informed the group that compilation of the final 1996 yield results was in process and will be presented at a future meeting.

Sean described the process involved in retrieving information from the growers and their fields. First, a survey is done of each BASIC field in several areas of approximately 1/1000th of an acre, measured out based on row and plant spacing. Plant growth measurements or "mapping" is completed at measured intervals to determine the date of first flower, top and bottom fruit retention, vegetative state of the plant for growth regulation and yield estimates, to name a few.

Dr Swezey explained that the estimated average estimated yields have been found to be both higher and lower than actual gin records state, so an average was determined and established as the baseline for yield data. Estimated bales per acre are calculated by plant density and fruit retention and the results are compared to all areas of the BASIC program.

In 1996, the BASIC "control" growers (utilizing conventional farming practices only) averaged 50,000 plants per acre with yields at approximately 2.2 bales per acre, with a range of about 2 to 2.5 bales to the acre. The BASIC organic growers demonstrated the lowest plant densities averaging 13-15,000 plants per acre with higher bottom retention to also produce an average of 2.2 bales per acre. Meanwhile, the BASIC non-organic growers' plant densities fell within the average of the two other grower groups, however their average yield fell to approximately 1.8 bales per acre. Dr Swezey explained that the differences between the non-organic growers and the two other groups could reflect planting dates, mite stress, and other factors, however the general consensus seemed to agree it was most likely a result of late planting dates, with the non-organic growers planting very late in April, while the growers from the control and organic groups planted much earlier in the month or even in March.

Next Sean touched on the year-end grower interviews and how appreciative he was to have had such outstanding cooperation from the growers involved in the program. He described how a grower is contacted by a member of the management team to schedule a on-hour interview at the grower's discretion. The grower attends the interview with various information in hand as requested (if possible) and answers a few questions about general payment practices. Upon completion of the interview, the grower completes a reimbursement form supplied by the University of California, which is submitted by Sean or Polly and the grower receives a check for payment at $50.00 per hour for the time spent in the interview

Dr. Swezey next illustrated how information included in the study involves cultural, harvest, and marketing costs, such as bale assessments, certification fees for organic and transitional growers, brokerage and storage fees, among others. These costs are provided by the individual growers during the interview process and allows the comparison of production and other costs for at least two of the grower groups--the control and organic groups. Sean stated that the most interesting difference found in the "in field" costs was the severe contrast between the cost of chemicals for the two groups, with control growers averaging expenditures of approximately $100.00 or more per acre than their organic counterparts. However, the BASIC organic growers pay significantly higher bills for weed and grass control or "chopping" as this is done manually. BASIC organic growers also exhibit additional cultural practices such as cultivations and other field work which contribute an additional $30 to $50 per acre over conventional or BASIC "control" growers' costs. Sean also noted that since all data had not been completed as yet, the final figures should reflect some adjustments. Sean also stated that the costs presented did not include brokerage and other costs incurred specifically by organic growers during post harvest.

Next Dr. Swezey described how energy use is calculated and included in final cost analyses, based on the cost to produce the energy used. However, he explained that the costs presented at this time did not include the energy use costs, as they were still being documented and calculated. Sean continued to describe the various areas involved in calculating energy use costs and the importance of these considerations in per acre cost factoring.

Sean continued by stating that the highest savings were achieved by the BASIC non-organic growers, mainly as a result of Integrated Pest Management and the omission of added costs incurred in organic cotton production. He also reminded the group that 1996 was the first

year for BASIC, so it will be interesting to see and compare the 1997 data with those first year results.

Sean concluded by reiterating the importance of maintaining the anonymity of the growers and the fact that the information reported to anyone at any time is presented as group data and not individual grower data. Sean then tanked everyone for their time and turned the meeting back over to Coordinator Linda Sheppard.

Linda then described some of the challenges being met in the 1997 BASIC program, with the addition of new growers in farming areas unfamiliar to the management team and the successes being achieved by BASIC and the new growers thus far. One new grower in particular, is so excited at the results he is seeing in his fields and the expense he is saving that he can barely contain himself. He entered the program, specifically the IPM non-organic program, with very strong concerns about the effectiveness of the program in addition to outside influences constantly informing him that beneficials don't work and his fields were going to suffer if he did not maintain his previous conventional practices. His own independent Pest Control Advisor (PCA) issued his first recommendation for a miticide on April 27th, stating the mites were building and would get out of hand, and has since written at least three additional recommendations for chemical applications, all of which have been ignored by the grower and proven to be unnecessary. The crop is strong, with excellent top retention and a whopping 75% bottom retention, and all achieved at considerably lower costs than previous years. This suggests promising economic and yield results for the grower, restoring cotton farming for this grower to a lucrative business.

Linda then reminded everyone about the Summer Field Day and said she looked forward to seeing everyone there. With that, Linda thanked everyone for attending and the meeting was adjourned.

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Summer Field Day

Meeting Minutes
June 27, 1997

Once again, individuals met at C & M Organic Enterprises in Chowchilla to attend the Summer field Day sponsored by the Sustainable Cotton Project and the US and Cal EPAs. The group then traveled to the fields of grower/consultant Pete Cornaggia, Jr. Upon arriving at Pete's fields, JoAnn Baumgartner, BASIC Assistant Director and the Sustainable Cotton Project began the tour with a brief overview of the BASIC program. She related how Claude and Linda Sheppard began their transition into organic farming as a result of their concerns over the rising use of toxic agrochemicals in their fields, as well as the enormous costs involved. She explained that, although the Sheppards are organic farmers, they still continue to research new ways to reduce chemical inputs and excessive costs in farming while maintaining high yields and good quality. They teamed up with Dr. Sean Swezey of the UC Santa Cruz Center for Agroecology and Sustainable Food Systems, to conduct a 5 year comparison study of conventional and organic cotton farming.

In 1996 the Sheppards and Dr. Swezey combined with the Sustainable Cotton Project to kick off BASIC (Biological Agriculture Systems In Cotton), a program which, through funding by both the U.S. and California Environmental Protection Agencies, provides information and some assistance to growers interested in reducing chemicals and costs in cotton farming through sustainable farming practices.

JoAnn gave a breakdown of the members of the management team for BASIC and their various positions and continued to relate how, in 1996, BASIC focused specifically upon insecticide reduction and the alternatives available. She stated that for 1997, BASIC is concentrating on alternatives to herbicides in addition to a reduction in insecticide use on cotton. She continued to explain that BASIC plans to look at alternatives to growth regulators and defoliants at future meetings.

JoAnn then introduced Dr. Tim Prather, of the UC Statewide IPM Project in Parlier, who has been overseeing the trials of a flaming cultivator in some of the BASIC fields. Tim explained how the flaming cultivator does not actually burn the weeds away, but heats them up enough to cause the cells to break apart and the plant to wilt. One of the biggest problems with the flaming cultivator is trying to get the flame to hit the row along the base of the plant, however a recently designed flap which, when set at various angles, enables the flame to be directed at a smaller, more concise area. He continued to explain that caution must be exercised when using the flaming cultivator, as the cotton can be burned. The idea is to use the flaming cultivator at early intervals while the cotton is still in early vegetative state. A water shield can be utilized when the cotton is young to protect it from excessive heat damage. A temporary shield was rigged to the unit used for the BASIC trials and seems to perform pretty well.

Tim brought everyone around the flaming cultivator, describing the various parts and their functions. Then BASIC Grower Consultant, Pete Cornaggia started up the flamer and ran it down the row to show everyone exactly how the machine works. Tim explained that the flamer is run at approximately 4.5 mph, with a range between 3 and 5 mph, however the slower you go, the better kill you get on the weeds, but the affect on the cotton could be a little more damaging. Especially when the burner temperatures at full force reach approximately 2000 degrees farenheight.

Tim stated that the cost of running the flaming cultivator was less than ten dollars per acre for the gas, plus tractor costs. The flame cultivator itself runs from $5,200 to $12,000. He also explained that BASIC was not only researching the benefits of the flame cultivator, but the effects on the beneficial populations as well. Dr. Sean Swezey of UC Santa Cruz will be monitoring the beneficial populations in the flamed fields to see whether or not the beneficials are affected, and to what extent, if any, the surrounding populations are affected. In his preliminary findings, Sean stated that the beneficials seemed to disappear when the plants were flamed, however the populations were restored 24 hours after flaming. The big question is "What happened to the bugs that were in the field before flaming and were gone immediately after flaming?" Are the bugs destroyed, do they hide within the leaves and flowers of the plants, or do they just relocate to another area or plant until the danger is passed? These will be questions answered at future meetings when the research shows conclusive evidence one way or the other.

Tim was asked how often it would be necessary to use the flame cultivator during a cotton season and Tim responded by explaining that it would depend on the field and the soil. Basically, he explained that over time, the use of the flame cultivator could dissipate as not only the weeds are removed, but the potential for seed destruction in the soil is there as well. Since the cultivation of soil turns the soil over and brings all the weed seeds to the top of the soil, and the flame cultivator burns the top of the soil, it stands to reason that many weed seeds will be roasted completely and not germinate at the next irrigation. The flame cultivator also produces less dust than a conventional cultivator because you don't disturb the ground as much.

Next, Pete Goodell, UC - IPM Specialist, Kearny Agricultural Center, gave an overview of pest pressures in the Central and South valley, focusing mainly on lygus and whitefly. Then everyone broke into groups, led by Sean Swezey and Polly Goldman, who captured some insects with their nets and placed them into specially aerated, clear bags for everyone to view. Various pests and beneficial insects were recognized and shown to the groups, with brief descriptions of the insects and their roles.

Following the insect recognition and identification, Ralph Jurgens of New Era Farm Service in Tulare gave an informative presentation of nutrient deficiencies and plant physiology in the field. He explained the importance of maintaining good soil health to make stronger and more prosperous plants, as well as increase yield and income potential.

The group then moved on to Sheppard Farms, where a wonderful buffet luncheon was waiting. Following the luncheon, Linda Sheppard, Program Coordinator, introduced Dr. Daniel Gonzalez,

Dept. of Entomology, UC Riverside, who gave an enlightening presentation on Biocontrol agents in cotton and the need for use of BC Cotton as an integral part of any IPM Program.

Following Dr. Gonzalez, Linda introduced Mr. Ed Davis of S & E Organic Farms in Bakersfield, who outlined marketing strategies and availability for specialty cottons and organics. He brought samples of various organic products he has been involved with and offered a brief but informative video of the organic cotton market situation.

Linda concluded the meeting by thanking everyone for attending the field day and the group was adjourned.

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Fall Field Day

Minutes
September 23, 1997

The Fall Field Day began with a visit to the fields of 1st year BASIC grower, Mike Best. As Mike was unable to attend the field day, BASIC Program Coordinator, Linda Sheppard told the group of how Mike contacted BASIC this past spring after reading about the program in a cotton magazine. When Mike spoke with the Sheppards, he described a situation seen more and more these days, where production costs have become so excessive as to warrant consideration of planting crops other than cotton. He explained that this would be his final year of growing cotton unless he could bring his costs down, so he wanted to try beneficial releases to maintain his pest pressures and reduce his chemical bill from approximately $100 - $200 per acre to at least 1/2 of that.

Mike entered approximately 575 acres into a beneficial release program through C & M Organic Enterprises, Inc. of Chowchilla, CA in conjunction with BASIC and Crop Monitor of Chowchilla, CA. Mike followed his fields closely throughout the year, as well as his two independent PCAs and was surprised at the results. During the entire season Mike sprayed two of his five fields only one time, and at that time using a "soft" insecticide that did not harm the beneficials within his field.

Following a review of the field histories, the Sheppards and Mike Best came to the agreement that the slight concern with mites in the two fields was more than likely a result of a mite infested melon crop left in the field to decompose through the previous winter, thereby allowing the mites to overwinter in the field and continue pre-existing populations. Overall, Mike has been very happy with the program and expects to continue with the releases on his 1998-'99 crop.

Next the group traveled to the organic fields of Claude and Linda Sheppard, where the viewed the harvest in full swing. Dr. Sean Swezey, UC Specialist from the UC Santa Cruz Center for Agroecology and Sustainable Food Systems presented an update on crop progress and pest pressures in BASIC fields.

Sean outlined the crop progress, stating that yields were looking good and would be comparable to previous years' averages. Pest pressures were reasonably controlled, with no real outbreaks on any BASIC fields. Beneficials were keeping lygus, aphids and mites in check and growers were relatively pleased. He explained that he would have the actual figures and data available following the completion of harvest and ginning and would present them at a future meeting.

With that the group headed into Chowchilla for a buffet luncheon at Los Tejanos Mexican Restaurant. Following the luncheon, Dr. Tim Prather, UC Statewide IPM project in Parlier discussed the effects of flame cultivation on plant growth and beneficial insects in BASIC test fields. Tim began by explaining that the flame cultivator has been around for over 40 years, but no recent studies of its potential or effects can be found. The most recent information dates back to the 60's, so we are basically leading the pack again. Tim gave a brief outline of the flame cultivator and its components and abilities. He explained that the machine was originally used on approximately 10 inch cotton at about 3 miles per hour in the fields, however this year various speeds were tested and on cotton that was considerably more mature. In these fields Tim found that one important factor in using the flame cultivator was the angle of the flame. From all aspects, a flame angled behind the cultivator produced a better weed kill than a flame angled forward.

One problem with the flame cultivator was the ability to keep it constant on the row when the different soils affected the height of the flame cultivator and the position at which it was directed. If the soil was soft, the sled would sink lower into the soil and aim the flame at the row rather than the plant base, and in the same respect, a raised, hardened area of soil would raise the flame above the base of the plant and cause damage to the cotton plant as well. Overall, Tim stated that the flame cultivator eradicated many of the weed pests and showed the potential, with proper use, to clear up weed problems relatively well with minimal damage to the cotton plant. There was some problem with bind weed, or morning glory, however he stated there was about a 50% reduction of this weed pest in the flamed fields. He did state that further streamlining was necessary to produce a flame cultivator that would perform ideally, and that studies would continue to perfect this technique.

As for the beneficial insects, Sean Swezey gave an overview of the effects of the flame cultivator on beneficials in the fields. Sean explained how, following the flame cultivation, almost no change in beneficials could be found in the flamed rows. However, within 24 hours of the flaming, beneficial populations were decreased somewhat. In addition, it was also noticed that the affects on pests, especially lygus, were immense, with high numbers of dead adults in the flamed rows. Sean did explain that this was only the first look at the study and would require additional research to compile complete information, but overall the flame cultivator seemed to be an upcoming tool for pest and weed control in cotton fields.

With that Linda Sheppard thanked everyone for attending and the field day meeting was adjourned.

B A S I C

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Meeting Minutes
January 29,1998

The final meeting of the 1997 season was held at Los Tejanos Restaurant in Chowchilla, California. Once everyone had ordered their breakfast, introductions were made round the room and once again, Dr. Sean Swezey UC Specialist at the Center for Agroecology and Sustainable Food Systems in Santa Cruz presented an interesting yet positive audio-visual year end update.

Sean first began by relating his recent trip to the Beltwide Cotton Conferences in San Diego earlier in the month, describing how BASIC was presented to growers and industry professionals from across the nation, and throughout the world. Sean explained that he was presenting the statistical data from the 1997 program and that overall, the BASIC program saw a good year, with a total average yield of 2.5 bales per acre. It was noted that in the future, field histories should be researched, at least minimally, to define the characteristics of the field and project the ability of the soil to handle the crop. Sean stated that there were still grower and gin interviews to be completed and they would have a complete update for the program at that time.

Dr. Swezey continued to explain that although the average was 2.5 bales per acre, the organic actually produced slightly lower than 2 bales per acre this year, which falls outside of the norm we have seen in the past 5 years. Ralph Jurgens explained that was why we needed to have petiole samples taken at various stages of plant growth, so we can pinpoint the cause for the yield difference. He stated that, should the petioles have shown a deficiency, it could have been remedied and the yield would have been higher. This year, BASIC plans to continue the petiole samples, however the tests will include additional information along with Nitrates. Julie Parker asked whether the decrease could be attributed to damage from the flaming cultivator, but Sean explained that the amount of acreage that received flame cultivation was not a large enough area to affect the entire crop yield. Sean and Ralph both stated that the remaining BASIC growers were planted on 30 inch rows with almost twice the plant density, which is an additional reason why the organic performed slightly lower., alongside the early cutout situation.

Sean next touched on the science of plant mapping and its importance to cotton growers. He told how the plant mapping showed the early cutout of the plants and, along with the defoliation problems experienced throughout the valley in 1997, created the decreased yields seen throughout the area. Ralph also explained how monitoring and maintenance of potassium levels in the plants can keep yields up as well, and should be watched in the next year's program. Sean also informed the group that BASIC was looking and the progress achieved through cover cropping and will have statistics and information on this stage of fertilization at a future date.

having the cover crop. Ralph suggests mowing or using a material that does not disrupt the roots and legumes produced beneath the soil, and then incorporate the remaining material into the soil for a buildup of micronutrients and nitrogen. Julie interjected that BASIC was planning to look at the benefits of cover cropping and various other fertility inputs during the 1998 season to provide additional information and more alternatives to its growers, including the planting of edges of fields and/or strips with nutrient producing beneficial habitats to assist with maintenance of soils in the fields.

Sean then touched base on the importance of alfalfa near BASIC fields and the benefits resulting therefrom. He explained how the alfalfa provides a beneficial habitat which also helps to provide lygus with a habitat preferred over cotton, which decreases the lygus actually in the cotton fields. Sean stated that some research had been done in 1997 on a BASIC field by one of his colleagues and the results should be available for review by BASIC some time in April.

Ralph noted how exciting the BASIC program is and how far it has come over the past two years, from the presentations to the data. He continued to state how important the information provided by the BASIC program is and how he couldn't understand why more people weren't listening to what is going on. Not only is the information offered at no cost to the grower, but many of those who have entered into the program have actually saved considerable expense. Sean stated that there were some growers listening, and others watching and that as long as we continue to offer the information and innovative technologies to the growers, more will begin to see the benefits being reaped by their neighbors and, in turn, desire to participate themselves.

A brief discussion then ensued regarding the performance of the flame cultivator in the organic BASIC fields in 1997. Linda Sheppard stated that they had learned a lot that year, especially that the earlier you utilize the flaming cultivator the better weed kill is achieved. The preliminary results are positive, however there will still need to be further research and adjustments to streamline the process. It was suggested that perhaps pre-plant flaming could be a benefit, to kill weed seeds prior to emergence, however Ralph suggested that the machine traveled too fast to heat the ground deep enough to actually kill the weed seeds, yet any that might be on the top of the soil could be destroyed. Sean informed the group that thanks were extended to Pete Cornaggia for all of his work involving the flaming cultivator and the trials he performed on his fields. Will Allen suggested BASIC look at the Texas Rod Weeder next year, which has had promising results with weed control. He explained that the equipment is used when the cotton is young, but strong enough to withstand the stress created by the machine. The group agreed that this implement would need to be looked into in 1998 and tabled it for a possible topic for a future meeting or even a field day.

With that Sean and Ralph concluded the presentations and arrangements were made with Everett Irving of Lemoore Naval Air Station to meet with growers involved in farming on the air base land to show them how to reduce costs and chemicals on their fields sometime in February, 1998. The meeting was then concluded and adjourned.

FYI

SJVCB SAYS "NO" TO COLORED COTTON

A referendum was mailed to 2,500 growers in the San Joaquin Valley Quality Cotton District asking for a response of yes or no to the following: "The growing of naturally colored cotton should be prohibited in the San Joaquin Valley Quality Cotton District." Ballots were returned by Jan. 3 and counted by the California Department of Food and Agriculture. However, according to California-Arizona Cotton magazine, March 1997, the referendum showed a turnout of only 25% of eligible voters representing 47% of eligible acreage actually responded, with the majority voting to prohibit colored cotton.

In other news, Dick Basset of the UC Shafter Field Station reported that all 14 Acala test varieties were equal to if not better than Maxxa in terms of fiber and spinning characteristics. Maxxa yielded 1,304 pounds of lint per acre, while test varieties varied in yield from 1,204 pounds to 1,360 pounds of lint per acre.

Basset stated that both the heat received in July and August and the early rains in October and November were damaging to the crop.◆

USDA NASS CHEMICAL APPLICATIONS: 1995

The USDA recently released its 1995 survey of agricultural chemical applications, including herbicides, pesticides and other chemicals. The survey was conducted on 11.7 million acres through 6 states, including AZ, AR, CA, LA, MS, and TX.

Herbicides, insecticides, fungicides, and other chemicals make up the four classes of pesticides presented in this report. Miticides and nematicides are included as insecticides. Growth regulators, soil fumigants, rodenticides, and repellents are included as other chemicals. This report excludes the use of seed treatments and postharvest applications to the commodity.

The chart below shows the Common Name and Trade Name for the chemical and total amount applied.

Common Name	Trade Name	Total Applied 1,000 Lbs.
Methyl parathion	several	5,053
Cyanazine	Bladex	1,795
Profenofos	Curacron	1,742
Aldicarb	Temik	1,101
Paraquat	Gramoxone, Starfire, etc.	598

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LOOK TO THE FUTURE...

BASIC holds its monthly meetings on the third or fourth Thursday of each month. The next BASIC meeting will be on Thursday, March 27, 1997 at the Eagle's Nest Restaurant in Merced, CA. Topics will include soil analysis updates and the benefits of good bugs (IPM).◆

If you would like to be on the BASIC mailing list, please contact Julie Parker at (209) 665-3925 or Eddie De Anda at (916) 589-2686.◆

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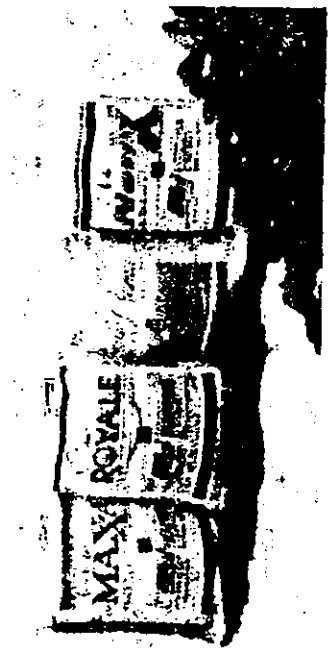

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BASIC - 1997 Preview

As there was no BASIC meeting in January, there are no minutes for this newsletter. Therefore, we would like to present to you an outline of the "BASIC" plan for 1997.

BASIC strives to promote the reduction of chemicals used on cotton, either by Integrated Pest Management or other sustainable techniques. We will continue to promote these techniques and to offer informative presentations outlining the various techniques, from flame cultivation to mechanized growth regulation. In addition, we will continue to provide useful information for conventional, sustainable and organic growers, including defoliant trials based on less toxic applications.

BASIC prefers its growers refrain from using preplant herbicide applications, so as not to disrupt the natural enemies around the fields. We will provide soil fertility testing for its growers and continue through the season by monitoring nutrients using petiole samples. In addition, we will continue to provide intensive scouting monitor pest and beneficial insect problems, and ensure timely beneficial releases early in the season and then as necessary throughout the year.

Adult Lacewing

We plan to utilize cover cropping in the fall to provide a strong buildup of organic matter and soil fertility for the following year's crop. This process will also be monitored and compared with other types of applications via soil analyses.

BASIC plans to provide information and opportunities to growers which can be economically and environmentally feasible, while creating the ability to reduce chemical use in cotton.◆

COTTON BLENDING: The Future of Organic?

Recently, several companies such as The Gap and Nike have expressed an interest in taking organic and conventional cotton in a new direction. In the past, Patagonia has led the way for large textile manufacturers by using only Certified organic cotton in its clothing line, however new ideas have stemmed from this, creating an entirely new market possibility for organic growers.

Although the large corporations feel that their requirements for large amounts organic cotton to complete a totally organic line cannot be produced at this time, using organic cotton as a factor in production rather than as the focal point may yield positive results. Blending is a building point, allowing corporations to reduce the environmental impact of their manufacturing in a way that will be cost effective.

Blending cotton presents an opportunity for overcoming and eventually eliminating the barriers of limited organic cotton supplies and the higher costs associated with the production of organic cotton fabrics. This should generate lower costs to consumers and higher demand for the products.

Blending does not eliminate the problem of excessive pesticide use in cotton, but it is a step in the right direction. By creating additional demand for organic cotton, more acreage will be converted to organic, thereby reducing more and more chemical use throughout the industry. In addition, growers will finally have a secure market for their cotton. Prices will then be able to come more in line with conventional prices; more strategic alliances within the organic cotton industry can be developed.

The Gap commissioned a report from Agricola Partners in California on the opportunities that exist for pesticide-reduced cotton in their industry. The report is currently under review by The Gap, which plans to release the findings and its intended plan of action later this year.

Source: Organic Cotton Monitor-Vol. 3 No. 2◆

1997 ESTIMATES

The National Cotton Council released its planting intentions report this past Monday, estimating 13.632 million acres will be planted to cotton during 1997. This is a reduction of 7.1% or 1.034 million acres from last years actual planted acreage of 14.666 million. The largest reduction of acreage seems to be occurring in the Delta, which was down 10.5% as a whole, while Arizona saw a liberal transfer from pima to upland with an 18% overall increase in cotton acreage. NCC expects the 97/98 crop to produce 17.8 million bales, compared to the 18.9 million bales produced in 96/97.

USDA's crop projections for 97/98 remain unchanged at 19 million bales, up 6% from last year.

Billy Dunavant, Dunavant Enterprises, Memphis, perceives the 97/98 crop to reflect 13.8 million planted acres for a total production of 17,750,000 to 17,850,000 bales. He feels that a good growing season will be reflected in lower prices during May and July, and early season problems will prove the opposite.

Source: DTN Cotton & Cotton Grower, February, 1997.◆

CALIFORNIA COTTONSEED PRICES

(Corcoran North) 2/18

Spot		March		Apr - Aug	
bid	offer	bid	offer	bid	offer
178	181	178	182	178	183

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COTTON UPDATE

According to the March report from the USDA, planting intentions are estimated at 14.67 million acres and harvest intentions are expected to be 12.83 million acres. This seems to reflect estimates based on the 1996 planted acreage, and is a considerable drop from their original projections of 19 million bales.

COTTON PRICES VARY

The average price received by upland producers during February was 66.7 cents per pound, down a penny from January's revised price and the lowest since 1994. At the same time, the upland spot price for base quality cotton was unchanged at 70.5 cents per pound in February. Only on year ago, this price was at 81.6 cents per pound.◆

EQIP FUNDING ANNOUNCED

The USDA in Washington announced preliminary state funding allocations for the new Environmental Quality Incentives Program (EQIP) totaling $200 million. EQIP was created and authorized in the 1996 farm law to consolidate several cost share programs including ASCS. The program will provide technical, financial and educational assistance to growers in addressing important natural resource concerns.

Source: DTN Satellite NewsBreak, 3/23/97.◆

FARMLAND DISAPPEARING

A recently released study by the American Farmland Trust revealed that high quality US farmland is disappearing at an alarming rate of up to 50 acres per day, with the greatest reductions occurring in central California. The study states that the decrease of US farmland results from the effect of urban sprawl and that if the trend continues at this pace, the US will be forced to import more food than it exports by the mid-21st century.

Source: DTN Satellite NewsBreak, 3/24/97.◆

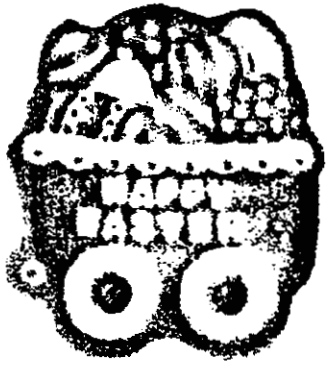
HONEYBEES AVAILABLE

If you would like information on the use of honeybees for the pollination of cotton or alfalfa fields, contact Casey Van Rys at (209) 537-6835.

LOOK TO THE FUTURE...

BASIC holds its monthly meetings on the third or fourth Thursday of each month. The next BASIC meeting will be on Thursday, January 23, 1996 at the Eagle's Nest Restaurant in Merced, California.◆

If you would like to be on the BASIC mailing list, please contact Julie Parker at (209) 665-3925.◆



BASIC

Biological Agriculture Systems In Cotton

Issue 11 March 1997

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Chowchilla, CA 93610

BASIC BASIC

(Minutes in brief)

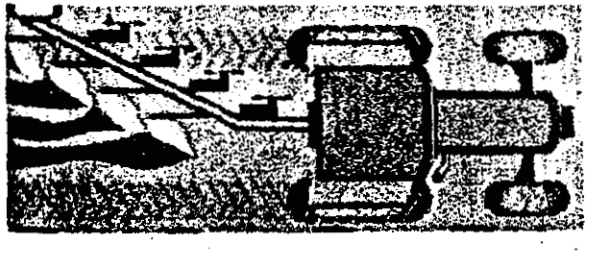
The February BASIC meeting was held at the Eagles Nest Restaurant in Merced, California on February 27, 1997. Approximately 20 attendees were present to hear Ralph Jurgens, Agronomist and owner of New Era Farm Supply in Tulare speak about the importance of soil fertility and the benefits of using natural and/or organic products to achieve and maintain the desired levels of fertility.

Ralph used various visual aids, in addition to an exceptional oration to provide growers and others in attendance with the information necessary to provide the ultimate balance of fertility required to produce good yields.

Unfortunately, due to technical difficulties, the minutes from this meeting are unavailable at this time. BASIC will attempt to correct the difficulties and provide the minutes to interested parties at a later date.◆

COMPANY SEEKING TEST ACREAGE

American BioDynamics in Nampa, Idaho is seeking cotton and almond growers interested in testing a *new* formula of garlic spray which does not kill insects only repels them, especially mites. The product is mixed with vegetable extracts which are reputed to make it more effective than previous garlic sprays, such as Garlic Barrier. The product denies the mites a food source so they have to go elsewhere to feed. For more information contact Joe Hautzinger at (800) 590-7645.◆



BASIC OFFERS CREDITS

BASIC recently received authorization from the Department of Pesticide Regulation and CAPCA to offer credits to PCA's and other applicable parties for attendance of BASIC meetings. The March 27th meeting will kick off the program, with 1.5 DPR and 2.0 CCA credits available to those attending. Anyone seeking additional information can call the BASIC office at (209) 665-3925.◆

BASIC TO PROVIDE FREE TESTING

The 1997 BASIC program will provide soil sample testing to all BASIC growers at no charge to the grower. In addition, test results will be reviewed and recommendations will be presented by Ralph Jurgens of New Era Farm Service in Tulare, CA. BASIC is also planning to provide petiole analyses throughout the growing season, with recommendations from Ralph to be included there as well. This information should provide the BASIC growers with knowledge of their plant and soil fertility and enable them to maintain their correct balances.◆

CALIFORNIA COTTONSEED PRICES

(Corcoran North) 3/24

Spot		Apr-Sept		Oct-Dec	
bid	offer	bid	offer	bid	offer
196	201	198	204	180	183

GROWER PROFILE

Reg Upton is a second generation farmer in the Chowchilla area who growers organic cotton and beans. In addition, he has almonds which, although not organic, are grown "pesticide free".

The Fresno State graduate has been in farming since 1965. He was on the Chowchilla City Council, serving several years as mayor. Also, he is past master of Chowchilla Masonic Lodge #485.

Besides providing organic products for the consumer, Reg's farming philosophy is "Unlike birds, we do not want to mess in the nest". Cutting back on chemical pesticides should help improve the local environment, and the quality of life, making it better for friends and neighbors.

During our conversation, Reg recalled that years ago, when cotton was too low priced to justify spraying, all the growers in this area stopped spraying and the beneficials were so abundant there was no need to spray. Reg learned from the past, and began to use beneficials. He says that he follows the saying, "if we don't learn from our past mistakes, we are destined to repeat them.

"Unlike birds, we do not want to mess in the nest". says Reg Upton.

Reg says his biggest concern is water. Being that Chowchilla is considered a desert area, it is imperative we have an available supply of water at all times. He is most frustrated with the fact that although there are a great number of people who want organically grown products, most, if not all are reluctant to pay for the additional effort required to produce such products. However, Reg is undeterred; he will continue growing his organic cotton and beans for the right reasons.◆

ED SAYS

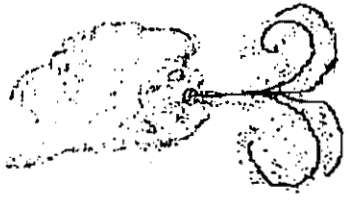
By Ed Roberts, PCA of Crop Monitor

Wind, Wind, Wind!! Most of the time cotton growers worry about rain at planting time. This year it was the wind.

As there was no rain after preirrigation to even out the moisture, some growers had to irrigate the cotton up or water just after emergence.

My concern is that I'm seeing cotton that's not growing, and if it's not growing, it's not going to stay ahead of mites and other pests. I feel growers should evaluate their own cotton fields and then make the adjustments necessary to promote growth.

Next month we'll check on Lygus and see how it is (or isn't) affecting this year's cotton crop.◆



BASIC Featured in National Ag Mags

"Assessing the benefits" was the title of an exceptional article by Martha Brown describing the BASIC program and the positive effects it is producing. The Mid-February issue of California Farmer Magazine includes BASIC grower interviews and a complete outline of the program, its participants, and the benefits shared by all. the California Farmer Regional Office in Fresno at The Harvest Insurance Agency, (800) 252-0123.

A second article titled, "Getting By With a Little Less Spray" appreared in the March 15th issue of Progressive Farmer magazine. Karl Wolfshohl presented an enlightening view of BASIC and its goals. Anyone wishing a copy of the magazine can contact Progressive Farmer magazine at (800) 292-2340. Copies of these articles may also be requested by contacting Julie Parker at (209) 665-3925, or email: BASIC96@aol.com.◆

CPCSD Sets Seed Price

Recently, the California Planting Cotton Seed Distributors announced their 1997 seed prices, with some varieties receiving slightly higher prices than in the previous year.

Acala varieties were priced noticeably higher as a result of a projected decrease in cotton planting. Predictions for San Joaquin Valley plantings this year were only at about 1 million acres, of which CPCSD supplies approximately 80% of all seed planted on San Joaquin Valley upland acreage.

Bill Van Skike, Assistant General Manager at CPCSD explained the price hike saying, "We're looking at less cotton acreage this year. Less acres, less income."◆

Source: AG ALERT newspaper, April 16, 1997.

CALIFORNIA COTTONSEED PRICES

30 day avg. (Corcoran North) 422/97

Spot		Apr-Sept		Oct-Dec	
bid	offer	bid	offer	bid	offer
212	215	211	217	180	183

HONEYBEES AVAILABLE

If you would like information on the use of honeybees for the pollination of cotton or alfalfa fields, contact Casey Van Rys at (209) 537-6835.◆

LOOK TO THE FUTURE...

BASIC holds its monthly meetings on the third or fourth Thursday of each month. The next BASIC meeting however, will be our ***Annual Summer Field Day on Friday, June 23, 1997*** starting at the office of C & M Organic Enterprises, Inc. in Chowchilla, California. Flyers with maps will be sent out to everyone soon.◆

If you would like to be on the BASIC mailing list, please contact Julie Parker at (209) 665-3925.◆

BASIC

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BASIC BASIC

(Minutes in brief)

Our monthly breakfast at Los Tejanos Restaurant in Chowchilla, California was held March 27, 1997. Announcements were made by Coordinator Linda Sheppard, who then introduced Ralph Jurgens, Agronomist, of New Era Farm Service in Tulare, California. Ralph reviewed soil analyses for three of the BASIC growers consultants. This was done as a demonstration of the type of analysis and recommendations BASIC growers can expect to receive.

As Ralph reviewed each growers' sample, he related how microbial values should be a major concern right alongside nitrogen, potassium, potash, etc. He explained that manganese and boron were essential in plant health, because the boron stimulates the uptake of magnesium and improves square and boll retention. He also explained how lower calcium in relation to magnesium can stimulate nitrogen uptake in fields with more acid and create plants lush to the point of rankness.

Ralph was amazed at the low sodium and almost perfection of PH balance that was found in the soil. He then informed the growers that the cost to correct the imbalances could run between $8.00 and 20.00 per acre for the year, however, he justified it economically by reducing compost or manure applications from 15 yd/ac to 2 yd/ac.

Ed Roberts, PCA of Crop Monitor in Chowchilla, California next presented his concerns for pest pressures in the '97-'98 crop. He described wheat characteristics which suggest the possibility of a low aphid year.

Next Linda introduced Joe Hautszinger of American BioDynamics in Boise, Idaho, who presented a product he is conducting trials on, as a systemic miticide consisting of garlic and other products. He explained how the plant becomes "garlic flavored" to pests, driving them out of the field to find a new food source, without harming the beneficials. Results will be relayed when received.

Linda then thanked everyone for coming and the meeting was adjourned.◆

History of Chemical Use In Cotton Reveals Evidence of Pest Resistance

At the recent 25th annual California Plant & Soil Conference in Visalia, PCA Phil Larson of Wilbur-Ellis Co. in San Joaquin, described how pests have developed a resistance to various chemicals throughout the years. He explained that, although each season seemed to bring a new, more promising pesticide, the pests eventually developed some form of resistance to them. Unfortunately, this has resulted in stronger pesticides with higher levels of toxicity. Still, a conversion is taking place and Larson praised UC farm advisors and their work with integrated pest management saying, "You so ably helped us in our cotton, and we thank you."

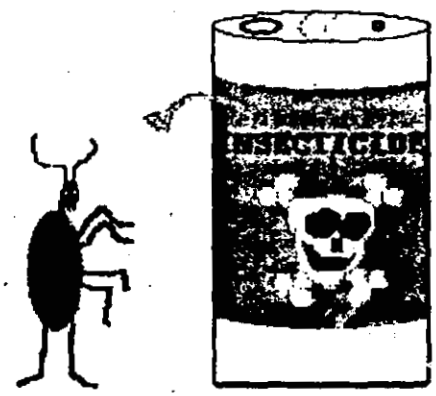
Pete Goodell, IPM Specialist at the Kearney Agricultural Center in Parlier also addressed those attending the conference stating, "What we do in cotton will impact what's going on in other crops." He explained that since a variety of crops are grown in the San Joaquin Valley, regional management is required to achieve successful pest control. According to Pete, regional management should require a basic IPM program in order to minimize or even eliminate exposing pests, crops and people to insecticides. He suggested growers "not pull the trigger on anything until you have an economic justification for it."

Beth Grafton-Cardwell of the Kearney Agricultural Center explained that resistance is the result of insects and mites that survive certain levels of pesticides and consequently pass on their resistant genes to the next generation. Some pests can resist two different classes of insecticides, such as organophosphates and carbamates, she added. Beth, too, resounded the need to resist over use of pesticides. "Use new chemicals as infrequently as possible and rotate those with old chemicals" she said. "Growers must use biological and cultural methods of pest control as much as possible."

The resistance of Lygus to Capture (R) represents a valid concern to valley growers. Originally registered in 1991, Capture began receiving reports of weakened effectiveness as early as 1993, and second applications of the chemical in 1994 resulted in control for only 10 days or less, compared to 35 days of control in 1991. It was recommended that the pyrethroid be used only once a season in cotton and alfalfa to help minimize resistance development.

Mark S. Grewal of J. G. Boswell Co., commented, "It is very short-sighted when a grower cuts his hay without leaving strips, infesting a neighbor's cotton field with lygus, or not spraying his safflower as a trap crop and allowing those pests to affect surrounding crops. These types of practices hurt us all and influence the survival of pests and their ability to gain resistance." He continued to say that farmers must take responsibility for pests leaving their ranch, just as they are responsible for their chemicals drifting onto a neighbor's field. Mark explained that farmers should work with their neighbors to achieve mutual cooperation by coordinating rotational crops and pest controls to the benefit of all parties concerned. He called for chemical companies "to deliver as low a cost of control as possible, so PCAs can apply recommended rates that a grower won't try to reduce to save money."◆

Source: AG ALERT newspaper, April 16, 1997.



PEST PRESSURES

Pete Goodell, Extension IPM Specialist, explains how, with degree days averaging 15-21 days ahead of the 30 day average, heat units are rising at such an accelerated rate that crops are actually surpassing any average year crop models.

Ag professionals and greenhorns alike are concerned whether this unusually warm and dry spring will create additional pest pressure for valley growers. Pete says that mites are pretty stable, except those fields that are influenced by neighboring crops. First irrigation is getting underway in the central valley, with the south valley going strong and the north valley planning to start around the first week of June.

Mites have been found in various fields throughout Merced County, but only in isolated areas, notes Paul Leonardo of Agri-Valley Consulting in Merced. Paul states that although they're only found in isolated areas, "they are dispersed enough through the stands to warrant full spraying. With mites in the 25-30 range and the heat lately, we're seeing them really begin to cycle."

Dan Munk, Extension farm advisor in Fresno County says, "We're seeing mite treatments go on in different parts of the county, but there are no real hot spots."

Madera County's Extension farm advisor, Ron Vargas states, "No mite concerns right now. Treatments are still being made, but they are sporadic. I've been through the valley this week. A grower in Kern County who already treated lygus, said mites were lower than they had been in the last two to three years."

Aphids are of no real concern at this time, as beneficials seem to be keeping them in check. Some hatches of beet armyworms have been noticed, but beneficial pressure is holding there as well.

A Special Lygus Advisory was issued in the MiteFax publication, San Joaquin Valley Cotton, May 26, 1997. The advisory is based on reports and limited survey information, which seem to show that pressures can be moderate to serious at various locations. Kern, Kings and Tulare Counties are already indicating Lygus migrations of great proportion, with some fields averaging 8 per 50 sweep counts. So far, samples taken on the Westside reveal low populations and relatively no pressure from lygus. Migrations are expected to continue 10-14 days longer as alfalfa continues to be harvested. Future migrations will follow from crops such as tomatoes, sugar beets, seed alfalfa, and any other "excessively weedy" crop to be harvested during the growing season.◆

HONEYBEES AVAILABLE

If you would like information on the use of honeybees for the pollination of cotton or alfalfa fields, contact Casey Van Rys at (209) 537-6835.◆

LOOK TO THE FUTURE...

BASIC FIELD DAY!

IPM WEED MANAGEMENT IN COTTON AND BENEFICIAL INSECT RECOGNITION & IDENTIFICATION

Friday, June 27, 1997 9:00 -3:00

Luncheon provided*

Offering on farm demonstration of a flaming cultivator, speakers from various areas of cotton farming management, marketing and research, and a "hands on" workshop designed to provide growers and others with information which will enable them to recognize and identify beneficials in their fields.

**Vegetarian available if ordered by June 15.*

For more information about the BASIC Field Day, or if you would like to be on the BASIC mailing list, please contact Julie Parker at (209) 665-3925.◆

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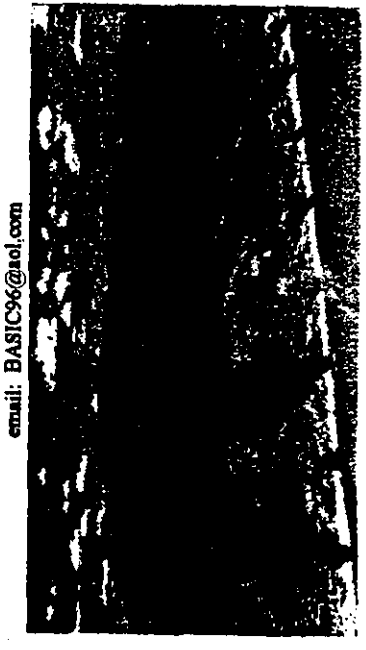


BASIC BASIC

(Minutes in brief)

The meeting began with everyone introducing themselves to the group and ordering breakfast. During the repast, the group watched a video on flame cultivation supplied by FLAME Engineering, Inc. of La Crosse, Kansas. Sean Swezey informed the group that Pete Cornaggia, Jr. had agreed to participate in some field trials in flame cultivation under the supervision of Dr. Tim Prather, Statewide IPM Project Weed Management Specialist, UC Cooperative Extension.

Following the flame cultivation film, Dr. Sean Swezey gave a brief but informative overview of the 1996 BASIC year, including production costs, as well as our plans for BASIC in 1997. He explained that there was basically no difference in average yields when comparing the 1996 conventional growers with the 1996 BASIC growers, with both types of growers averaging approximately 2 - 2 1/2 bales per acre. Sean explained that the elements of BASIC include

A. A good number of growers involved who are searching to be as efficient as they possibly can with all their chemicals and all their costs. BASIC strives to present new and updated information to its growers so to provide them with as many tools as possible to help them achieve those goals.

B. A bi-level program involving Phase I growers(IPM use) and Phase II growers (Biological, Transitional or Organic farming practices) which offers several approaches to chemical and cost reduction without biases caused by program "labels" such as Phase I and Phase II. BASIC recognizes and respects each grower as a grower and nothing else

Sean illuminated the workings of BASIC by explaining how each facet of the project relies on the other to either conduct, retrieve, document, present, and at times, receive information, etc. on behalf of the BASIC program, and that without teamwork, without the efforts of any one person, the BASIC program would not survive.

For a complete copy of the minutes call Julie Parker at (209) 665-3925.◆

MOTHER NATURE'S IPM PROGRAM

Who says it's crazy or impossible?

Not Claude Sheppard of Sheppard Farms in Chowchilla, California. Claude grows approximately 700 acres of Certified Organic cotton and 150 acres of Certified Organic processing tomatoes. This year, Claude is watching his tomatoes take care of his cotton, through one of Mother Nature's IPM programs!

Claude has grown Certified Organic processing tomatoes for two of the last three years, with a 0% worm count and is planning to do it again. However, this year he plans to reap one of the other benefits of being a tomato grower; he gets free assistance with maintaining his lygus pressure for his adjoining cotton crops.

Claude drives his fields several times a day and during the years that he has grown tomatoes, he has noticed that some of the beneficials in his cotton tend to migrate and interact with those in the tomatoes fields, and that lygus pressure in the cotton always seemed less evident when tomatoes were growing nearby. Yet, although the beneficials are on the move, pest pressures are still being maintained and reduced. Although Claude, like any other cotton grower, is concerned with lygus, he is mainly concerned with the nymphs, and not the flyers (adults). "If you have flyers in your field, they're just looking for a place to stop and lay some of their eggs. It's the nymphs who feed directly on the plant and create the most damage and the highest square loss."

This year Claude will be viewing his tomatoes not only as a possible trap crop, such as alfalfa, but an insectary as well. He feels that since the tomatoes are harvested only once and at a much later date than alfalfa, sometimes as late as August, perhaps this will keep the lygus away during the most critical period of fruit production, squaring. Claude says Lygus seem to prefer tomatoes over cotton, so he's betting the tomatoes will help keep the lygus out of his cotton. Good Luck Claude!◆

ED SAYS

By Ed Roberts, PCA of Crop Monitor

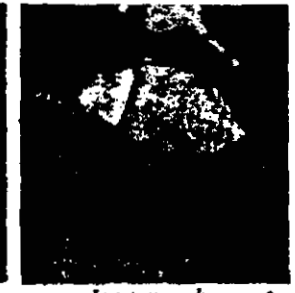
So far this year mite pressure has been low. Unfortunately, this year's cotton is drier than normal because we didn't receive our February and March rains. Most cotton that has not been watered yet could use an irrigation to stimulate growth and reduce stress. If the cotton growth stagnates, and is under stress, it cannot "out grow" the mite, and it can't "out square" the lygus Additionally, pests tend to attack weak, sickly, and stressed plants more often than strong, virile, healthy plants.

Beneficial populations are strong. We seem to be finding a lot of big eye bugs and thrip in the fields this year, which will assist in protection against mite, aphid, and lygus. Most of the cotton we are now checking is at square set. So far, lygus counts have been low.

It seems our winds are staying with us this year. This can cause the cotton to dry out more rapid than normal, so watch your moisture closely.

Here's the ones to watch for:

Adult lygus ◆



Lygus nymph ◆

CALIFORNIA COTTONSEED PRICES

(Corcoran North) 5/29

June		Jul-Aug		Oct-Dec	
bid	offer	bid	offer	bid	offer
224	229	225	230	180	183

◆

ED SAYS

By Ed Roberts of Crop Monitor

Most cotton has been watered by now and begun to set squares. Growers should monitor their crops closely to determine whether they are going into fruiting or vegetative stages.

Mites can be found in most fields, but predators are keeping them in check. For growers who applied Temik, predator populations will be sparse, so as the Temik wears off, one should watch for mites and lygus.

In fields where Temik was not applied, we are seeing good beneficial populations, such as lacewing, thrip, spiders, damsel and big-eyed bugs.

Now is the time to watch square set. If the square shed increases, try to determine the cause of the shedding before you spray. Shedding can occur naturally, or as a result of various conditions, such as stress, weather, or insect pressure, and unnecessary spraying will not only deplete predator populations, but budgets as well.◆

Big-eyed bug

CALIFORNIA COTTONSEED PRICES

(Corcoran North) 6/25

June		Jul-Aug		Oct-Dec	
bid	offer	bid	offer	bid	offer
231	236	234	240	182	186

WEEDS MAY BECOME IMMUNE TO HERBICIDE

(UPI) - A specialist at the University of Nebraska-Lincoln says weeds may, someday become immune to "roundup" herbicide. Alex Martin says researchers in Australia discovered a strain of roundup-resistant ryegrass just last year. And the danger of such an occurrence in the US is increasing as more American farmers begin planting "roundup-ready' soybeans and other crops.

Martin says the best way to avoid the problem is not to use the "roundup-ready" varieties in successive years of any crop rotation. "Roundup-ready" crops contain special genetics which allow the plants to survive applications of glyphosphate herbicides, such as roundup.

(Source: DTN Satellite News, June 25, 1997.)◆

HONEYBEES AVAILABLE

If you would like information on the use of honeybees for the pollination of cotton or alfalfa fields, contact Casey Van Rys at (209) 537-6835.

LOOK TO THE FUTURE...

FIBER FUTURES '97 Conference & Expo July 1-2, 1997 in Monterey, California. The Conference and expo is to be held in tandem with the California Resource Recovery Association's annual conference on "Zero Waste". For more information call Conference Coordinator Jeanne Trombly at (707) 823-2800 ext. 46 or e-mail: info@fiberfutures.com.

The July BASIC breakfast meeting will be held at Los Tejanos Restaurant in Chowchilla, on Thursday, July 24, 1997. Speaker to be announced.◆

If you would like to be on the BASIC mailing list, please contact Julie Parker at (209) 665-3925.◆

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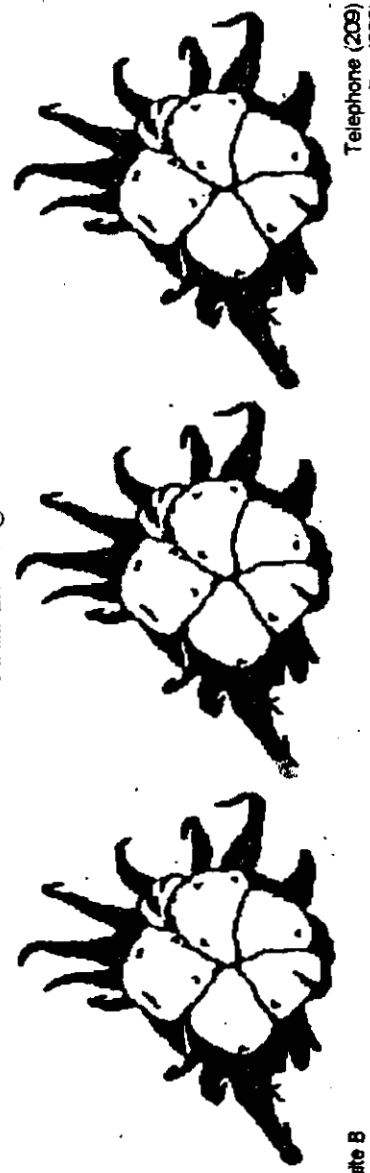

BASIC BASIC

(Minutes in brief)

The May BASIC brought a diverse group of individuals together to hear Dr. Scan I. Swezey outline the economic factors and findings of the 1996 BASIC program.

Scan first outlined some of the components of the BASIC program, as well as the preliminary production and harvest costs per acre. He continued to say that all the information was contributed by the growers in the program and documented in a format designed to keep the growers' identities and individual information anonymous in order to maintain a constant throughout the project.

Dr. Swezey next described the grower interviewing process, which is totally at the grower's discretion. The grower answers a few questions and provides (if possible) various records to substantiate the information documented during this research. Plant mapping is completed at various intervals of the growing season to determine the date of first flower, top and bottom fruit retention, recognition of growth stages and whether they are vegetative or fruiting, and yield estimates.

Scan next illustrated how preliminary information included in the study has shown conclusively that organic cotton production is costlier than conventional cotton, however the final results will be presented at a future meeting.

Scan also explained how energy use is calculated into the cost factor and concluded by stressing the importance of maintaining grower anonymity in data management to maintain a constant in the research.

Linda Sheppard then related the positive progress being achieved by one of our newest growers on the Westside and reminded everyone of the Summer Field Day coming up on June 27th and stated she hoped to see everyone there. With that she thanked everyone for attending and the meeting was adjourned.◆

PEST PRESSURES

Locally growers are seeing some mites and lygus in the fields but predators seem to be the dominant insects, keeping pests well below thresholds. Bill Weir, Merced County Extension farm advisor says, "We're continuing to see mite populations and the number of infested leaves decline in untreated check plots in our miticide comparison tests."

Aphids have also been found in a few fields around Chowchilla, but here, too, predators are holding their own. The majority of aphid treatments seem to be occurring in the South valley, specifically Kern, Kings and Tulare counties. Most PCAs say aphids are turning up mostly in spots, but dark morphs have been reported in Kern county.

Lygus populations remain light to moderate, but treatments continue on a fairly widespread basis. There have been no reports of severe pressure in the vicinity of Chowchilla, but Tulare County Extension farm advisor Steve Wright says lygus have "slam dunked" fields he's seen, leaving them with zero retention.

Constant monitoring of the crop is of the utmost importance at this time, with specific emphasis on nymph counts, since nymphs cause the greatest amount of damage and square loss.

(Source: DTN Satellite News, June 25, 1997.)◆

CROP CONDITIONS

While this year's crop promises to be a good one, valley growers at the Kings, Tulare and Madera-Merced county meetings were not predicting any record breakers.

Retention varies widely throughout the valley, with averages appearing to be lower and vegetative growth reported to be higher than in reports of the past few seasons. According to Extension IPM entomologist Pete Goodell, lygus seem to be the concern of specialists in the south valley, with dissected dropped squares showing insect damage, however physiological factors may also be involved. Goodell and cotton specialist Bob Hutmacher say square losses can't be easily associated with weather or fertility problems.

Above average heat units in May gave crops a jump start on the season with locations around the valley 3-15 days ahead of normal degree day totals. Degree Day Accumulations are running from 62-269 days ahead of the 30 year average, yet the gap has shortened somewhat in the recent weeks, with dry and windy conditions adding to the stress of some stands. Fruiting seems to have started lower in the plant than is normally expected, with some fruiting well underway on the fourth branch consistently in a couple of fields. Flowering has been reported southwest of Chowchilla near Red Top in Madera County.

The USDA weekly crop progress report released 6/23/97 lists California at 55% squaring with conditions reported at 70% good and 30% excellent, which is 11% above this time in 1996 and 22% above the average. Arizona crop progress reflects 81% squaring which is just above the average 80% in that state, but conditions vary from 11% fair, 53% good, and 32% excellent, with 4% poor and very poor. Texas experienced a difficult start, but appears to have made up for lost time with squaring at 28%, which is slightly below last year's 31%, but just above the average of 27%. Unfortunately the condition of the crops has suffered somewhat with 19% poor or very poor, 29% fair, 43% good, and only 9% excellent.◆

(Source: MiteFax, San Joaquin Valley Cotton, June 23, 1997 and DTN Satellite News, June 25, 1997.)

GROWER PROFILE: MIKE BEST

BASIC grower, Mike Best is not afraid of nything, in fact, you could almost say he likes to be irst.

Mike is a first generation farmer who has been abbling in the dirt for over 17 years. He is a first ear BASIC grower, utilizing IPM for the first time, nd the first grower in his area to use IPM in his otton fields to such an extent as to save him a great eal of expense and promote him to commit to the se of IPM in his fields for 1998.

Originally from Clovis, California, Mike now esides in Firebaugh, farming approximately 700 cres of cotton, tomatoes, melons, and almonds etween Firebaugh and Oro Loma/Eagle Field, 'alifornia. Mike decided in 1997 his chemical costs /ere more than he felt were reasonable, so after :ading an article about BASIC and Claude heppard's success with IPM, he gave Mr. Sheppard call. Mike found that, in a world where pesticide prays can cost on average between $100 and $250 er acre per crop year, IPM costs are $40 per acre er crop year. Mike says that "...so far, so good, it ill be an excellent year if the yields are as good as ıey look to be." He feels that the greatest concern or farmers today is bugs and how to combat them, xpecially without high costs. Perhaps this time like has found the way *J. Parker*

USDA CLASSINGS

9/19 - USDA's weekly report of cotton classed under the Smith-Doxey Act reflects a total of 110,975 bales classed. Of those, 110,481 were Upland cotton, with 61.8% tenderable.

For the season, there have been a total of 647,410 bales classed. Of those, 646,295 were Upland cotton and 67.2% have been tenderable.

California reflects 5,525 bales classed. Of those, 5,525 were Upland cotton.

FUTURES 9/22

OCT '97	71.96
DEC '97	72.81
MAR '98	74.03
MAY '98	74.75
JUL '98	75.36
OCT '98	75.43
DEC '98	74.73

LOOK TO THE FUTURE.....

BASIC's September meeting will focus on farm safety for growers and employees. It has been tentatively slated for Thursday, Oct. 30. Time and location to be announced. DPR and CCA credits have been applied for and space is limited, so RSVP for yourself or your employees early. Contact Julie Parker at (209) 665-3925 .

1998 BELTWIDE CONFERENCE

Coming January 1998 in San Diego. Information on dates and who to call for reservations is available at the BASIC office. Please call Julie Parker at (209) 665-3925.

BASIC
Biological Agriculture Systems In Cotton
Issue 16 September 1997
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BASIC BASIC

(Minutes in brief)

TECHNICAL DIFFICULTIES - PLEASE STAND BY.....

BASIC would like to extend an apology to all those who have not received some of the newsletters or minutes this year. In an attempt to upgrade our systems to produce information in a faster and better quality, we have experienced several technical problems which have delayed production of these informational tools.

Complete annual packets or replacement minutes will be available in late November and may be ordered through the BASIC office by contacting Julie Parker at (209) 665-3925.

BASIC SUGGESTIONS

Scratch paper and a suggestion box will be available at the Fall Field Day and the October meeting for anyone with suggestions for improving the program for 1998. BASIC does ask that the suggestions be reasonable and reminds everyone that we are a non-profit program and are limited to the funds available in the project.

CALIF. PESTICIDE USE CONTINUES TO RISE

SAN FRANCISCO (AP) - Use of chemical pesticides in california rose by 31% between 1991 and 1995, and spreading of the most toxic chemicals was up even more sharply, a private study finds.

The increase, whose significance was challenged by state officials, comes as consumers, agriculture researchers and many growers seek ways to lessen the amount of chemicals used in farming, gardening and landscaping.

"People in California have expressed an interest in reducing the release of pesticides into their food and into the environment," said James Liebman, staff scientist with the Pesticide Action Network, which conducted the study. The fact that reality is going in the opposite direction is both disturbing and in opposition to what the public says it wants."

Annual use of cancer-causing pesticides rose 129%, to 23.4 million pounds, and nerve poisons climbed 54%, to 8.6 million pounds, according to the group.

Veda Federighi, spokesman for the California Department of Pesticide Regulation, called the study bogus science and said that merely citing pesticide poundage proves nothing.

"The most important component of risk is not toxicity, it's exposure, and we regulate so that exposures to chemicals are at acceptable levels," Federighi said.

Ralph Lightstone, an attorney with California Rural legal Assistance Foundation, who has specialized in pesticide law for more than a decade, scoffed at that argument.

"If you spray a lot more, then there's bound to be more exposure," he said.

California is the only state that requires all agricultural pesticide use be reported. Farming accounts for about 90% of all such use.

Governor Pete Wilson's administration played down the numnbers by noting that the amount of harvestable farmland in California grew by 500,000 acres from 1991 to 1995. That increase - from 7.9 million to 8.4 million acres - represents only a 6% change.

Meanwhile, the California Farm Bureau Federation accused the researches of "cooking" the numbers and said the study did not take into account changes in weather conditions, crop types and pest infestations over the four-year period.

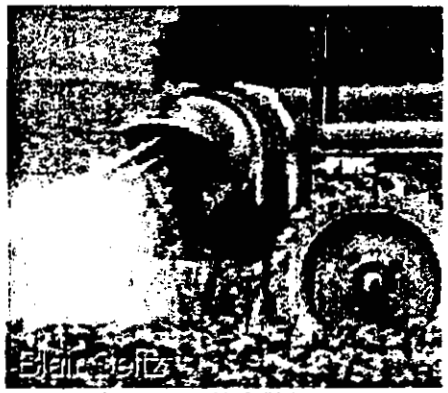
Liebman said he based his analysis on data collected by the state, using information provided by farmers and other pesticide users.

"I stand by my numbers because they come from state agencies," he said. "We do see fluctuations that account for weather. That's why we use five years."

The study found the most intense chemical use, where the greatest amount was applied per acre, was in Los Angeles County. Orange County was next and Santa Cruz County was third.

Santa Cruz County is a large produce of strawberries, the most intensively treated crop in the state with more than 302 pounds of pesticides per acre a year, the report said. The crop with the next highest was dates, with 140 pounds per acre.

Source: DTN Satellite News, 9/22/97)



PESTICIDE OR POLUTION??

F Y I

USDA CONTINUES CUTBACKS

The USDA recently announced another round of changes in the ongoing restructuring of its operations. The Natural Resources Conservation Service (NRCS), Farm & Foreign Agriculture Service (FSA), and the Rural Development Department will be combined into a single office, with most administrative functions to be handled at the state level. This move is to preserve the budget and maintain a high level of quality services.

The new unit is said to be identified as the Support Services Bureau, however, no county offices are scheduled to close at this time. The majority of the cutbacks, almost 80%, are to be at headquarters, leaving only a Board of Directors consisting of Administrators and will generate the great majority of a projected total savings of $127 million.

PLOWDOWN DATES

Local county dates for completion of incorporation of cotton stalks into the soil are as follows:

Merced County: Dec. 31st
Madera County: Dec. 31st

With the early crop this year, officials are reminding growers to complete their plowdown by these dates, as no extensions are expected to be available.

We are currently set to begin interviewing the BASIC and check growers; this will allow us to determine representative production costs and energy use for all types of production systems.

RAIN RUINS CROP IN GA

Recent rains in Georgia have soaked cotton fields beyond any tolerance levels. The normally white, fluffy crop hangs low to the ground, so discolored as to seem like soggy dryer lint, instead of new cotton at harvest. Growers estimate losses around $50K on about 800 acres.

Ag extension officials reported close to 30 inches of rain has hit the state since September, making this one of the wettest winters on record. Many farmers are unable to get into the fields to harvest their crop, and probably won't be able to return to the fields until after the new year. As a result, projected yields in Georgia have been lowered from 750 lb./acre to 680 lb./acre, and an estimated 5% of the state's total crop is a complete loss.◆

LOOK TO THE FUTURE...

The National Cotton Council's 1998 Beltwide Cotton Conferences will be held in San Diego from January 5 through the 9. For more information, please contact the NCC main office in Memphis, TN or the San Diego Marriott Hotel at (619) 234-1500.

BASIC holds its monthly meetings on the third or fourth Thursday of each month. The next BASIC meeting will be on Thursday, January 29, 1998 from 9:00 a.m. to 11:00 a.m. at Los Tejanos Restaurant in Chowchilla, CA.◆

If you would like to be on the BASIC mailing list, please contact Julie Parker at (209) 665-3925.◆

BASIC

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Appendix C

Farmer Updates

UNIVERSITY OF CALIFORNIA, SANTA CRUZ

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SANTA BARBARA • SANTA CRUZ

CENTER FOR AGROECOLOGY
AND SUSTAINABLE FOOD SYSTEMS

SANTA CRUZ, CALIFORNIA 95064

21 July 1997

Dear cotton growers:

Enclosed are updates from the BASIC plant mapping and insect sampling efforts through mid-July. The fields have each been given a code, to maintain grower confidentiality. To find data for your field or fields, look under the "treatment" column (treatments are either "B" for BASIC or "C" for check grower) and the "rep" column for your code. This is your code:

Code: trtmt _____ rep: _____

Tables: Each number on the tables represents an *average*. For the sweep net samples, each number is an average of four 50-sweep samples on each date in each field. For the plant map samples and the leaf insect samples, each number is an average of 20 plants or 20 leaves on each date in each field. Some fields have not been sampled every week. Wet fields, fields that have been sprayed, and sometimes time constraints prevent us from reaching every field each week. These tables are not intended to substitute for pest control information and recommendations made by a licensed pest control advisor.

Graphs: Graphs show a picture of averages for each treatment (BASIC or check), to give you an idea of how the two treatments are performing overall in time. The horizontal axis goes from June 1 to July 4; "Julian date" simply means the number of days of the year that have passed since January 1, 1997. For the sweep net sample graphs, the vertical axis is the average number of insects per 50 sweeps with a sweep net. For the leaf insects (mites, thrips, and aphids), the vertical axis is an insect rank (a value of 1 corresponds to no insects, 2 means up to 10 insects, 3 means up to 100 insects, and 4 means over 100 insects per leaf).

What do the graphs mean? You already know this from being in your own fields this season -- mite, thrips and aphid populations have been very low, and lygus populations, although rising, have also been quite low. Beneficial insect numbers (mostly bigeyed bugs and minute pirate bugs) are high in both BASIC and check fields, and are currently about twice as high in BASIC fields when compared to check fields.

In terms of plant development, BASIC and check fields have good retention of the top five and bottom five fruiting positions. However, BASIC fields are very slightly behind check fields in terms of plant height, nodes, and fruiting branches (and also slightly behind in terms of having greater time to cutout, as measured by nodes above white flower). Most of these differences appear to be shrinking as the season progresses.

If you have any questions about these graphs or charts, please feel free to contact Sean Swezey at (408) 459-4367, or come to our next breakfast meeting, which will be announced in the mail.

Sincerely,

Sean L. Swezey and Polly Goldman
Center for Agroecology and Sustainable Food Systems
University of California
Santa Cruz, CA 95064
(408) 459-4367

date	trtmt	rep	lygus	bigeyed bugs	minute pirate bugs	damsel bugs	assassin bugs	ladybird beetles	lacewing	spiders	All juveniles	All beneficials
5/30	B	1	0.5	1.5	1	0	0	0.25	0	0.5	0	3.25
5/30	B	11	1.5	2	0	0	0	0.25	0	0	0	2.25
5/30	B	12	0.5	5	0.5	0.5	0	0.25	0.25	1.25	0	7.75
5/30	C	6	0.25	1	0.25	0.75	0	0	0	0.25	0	2.25
6/7	B	1	1.5	7.5	5.25	0.5	0	0.75	0	0.5	3.75	14.5
6/7	B	5	2.5	5.5	5.25	0	0	1	0	0.5	3	12.25
6/7	B	6	1.75	2.75	5.25	0.25	0	4.5	0	0.5	4	13.25
6/7	B	10	0	1	0.5	0	0	0.25	0	0.75	0	2.5
6/7	B	12	0	4.25	0	0.5	0	0.25	0	1.25	0	6.25
6/7	C	2	0.25	1.5	0	0	0	0	0	0	0	1.5
6/7	C	3	1.5	1.25	4	0	0	0.25	0	1	1.75	6.5
6/13	B	2	0.5	1.5	0	0	0	1	0	0.75	0	3.25
6/13	B	4	0.5	1.25	2.75	0	0	1	0	2.25	0.75	7.25
6/14	B	5	3	0.75	9	0	0.25	0.5	0	0.5	0.5	11
6/14	B	6	2.75	1.25	3.75	1.5	0.25	3	0.75	1.25	1	11.75
6/14	B	7	2.5	2.5	3.5	1.25	0.5	0	0.25	1.5	0.25	9.5
6/14	B	8	3.5	4.25	3.75	0.5	0	0	0	0.75	2.5	9.25
6/14	B	9	2	1	12	0	0.25	0.5	0.25	0.75	1.5	14.75
6/13	B	11	0	1.25	0	0	0	0.25	0.25	0.5	0.5	2.25
6/13	B	12	0.5	1	0	0.75	0	0	0.25	0.75	0.75	2.75
6/14	C	1	0	1.25	1.75	0	0	0	0.25	2.75	0.5	6
6/14	C	2	0.5	0	3.25	0	0	0	0	0	0	3.25
6/14	C	4	0.75	4	0.5	0.75	0	0	0	0.5	0.75	5.75
6/14	C	5	2	0.75	4.75	0	0.25	0.5	0	0.75	0.75	7
6/13	C	6	1.25	2	1.75	0	0	0.25	0.75	1	1.5	5.75
6/14	C	7	3	1	3.5	1	1.25	1	0	1.5	0.5	9.25
6/14	C	8	1.25	1.75	3.75	0.25	0.25	1.5	0	2	0.75	9.5
6/14	C	9	0.25	0.5	0.25	0	0	0	0	0.5	0	1.25
6/13	C	10	1.75	1.5	5	0.5	0	0	0.75	0.25	1.25	8
6/13	C	11	2	1	3.75	0.25	0	0.25	0.25	0	0.25	5.5

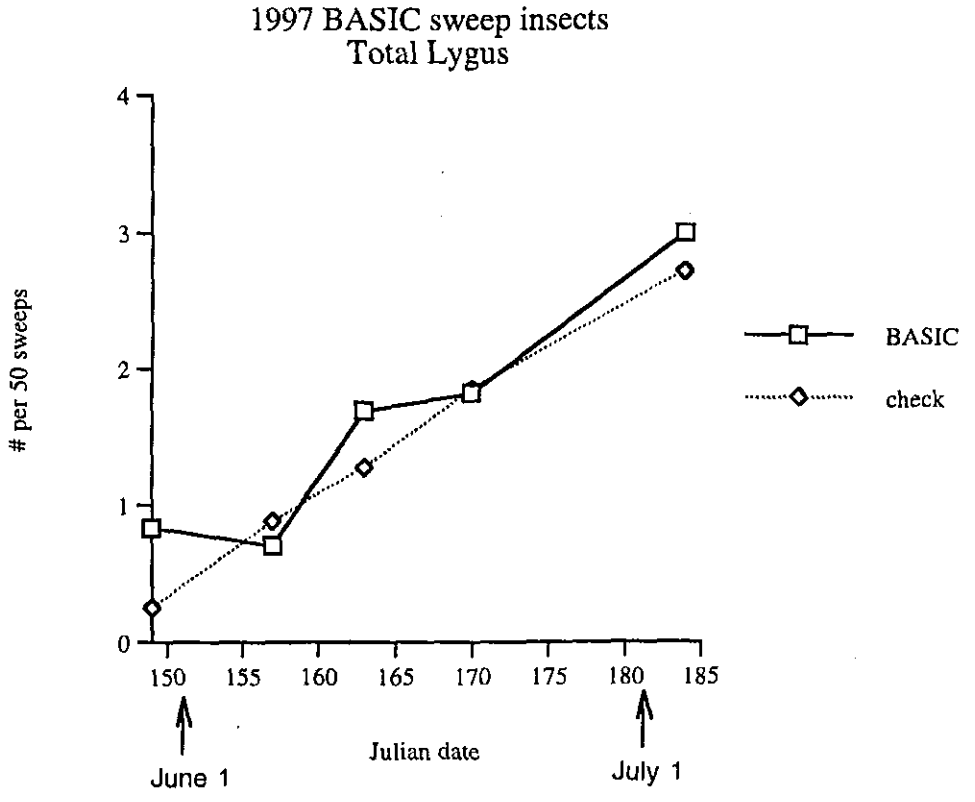
date	trtmt	rep	lygus	bigeyed bugs	minute pirate bugs	damsel bugs	assassin bugs	ladybird beetles	lacewing	spiders	All juveniles	All beneficials
6/20	B	1	3	11.75	4.5	1.25	0	0.75	0.25	0.25	4	18.75
6/20	B	2	0.75	10.25	1	0.5	0.25	1.25	0.25	0	2.5	13.5
6/20	B	3	0	4.75	1.25	0	0	7	0	0	5	13
6/20	B	4	0.5	2.25	1.75	0.5	0	1.5	0	1	0	7
6/20	B	6	2.5	5.75	2	1.5	0.25	0.75	0	0	1.75	10.25
6/20	B	10	4	6.75	2.75	1	0	0.25	0.5	0	0.25	11.25
6/21	B	12	2	6.25	3.75	0	0	0.25	0.75	0.75	2.5	11.75
6/20	C	1	1.5	2.25	3.75	0	0.5	0	0.75	0	1.5	7.25
6/20	C	2	0.5	1.75	2.5	0	0.75	0	0	0	0	5
6/20	C	3	2.75	4	7.25	0.75	0.25	0.5	0.75	0.25	1.75	13.75
6/20	C	6	2	4	1	0	0	0	0.25	0	1.25	5.25
6/20	C	10	2.5	5.25	2.25	0.25	0	0	0	0.5	1	8.25
7/4	B	3	3	12.75	11	0.5	0.25	1.75	0.75	1.5	5	28.5
7/2	B	5	3.25	3	10	0.25	0	0	1	2.25	3	16.5
7/4	B	6	5.75	13.25	7.75	0.5	0.5	0	0	2.5	6	24.5
7/4	B	7	3	3.25	15.25	1.25	0	0	0.5	0.75	2	21
7/2	B	8	3.25	5.75	10.5	0.25	0.25	0.5	0	2	4.5	19.25
7/2	B	9	2.75	1.75	12	1	0	0.5	0.75	1	2.75	17
1/1	B	12	0	0	0	0	0	0	0		0	0
7/4	C	1	2	3	6	0	0.5	0.25	1	1	1	11.75
7/4	C	2	0	1	0.75	0	0.25	0	0.25	0	0	2.25
7/2	C	3	4	2.25	3.5	0	0.25	0.25	0	1.75	2	8
7/2	C	4	2.25	6.5	6.5	0.75	0.25	0	0.75	0	4.75	14.75
7/2	C	5	3.5	1.25	3	0	0.75	0	0.25	0.75	1.5	6
7/2	C	7	3.5	1.25	4.5	0.25	0.5	0	0.5	0.5	2	7.5
7/2	C	8	1.75	0.75	4.5	0	0	0	0.75	1.5	2.75	7.5
7/2	C	9	4	1.25	5.5	0.5	0	0	2	0	2	9.25
7/2	C	11	3.5	5.5	7.25	1.5	0	0	0	1.25	3	15.5

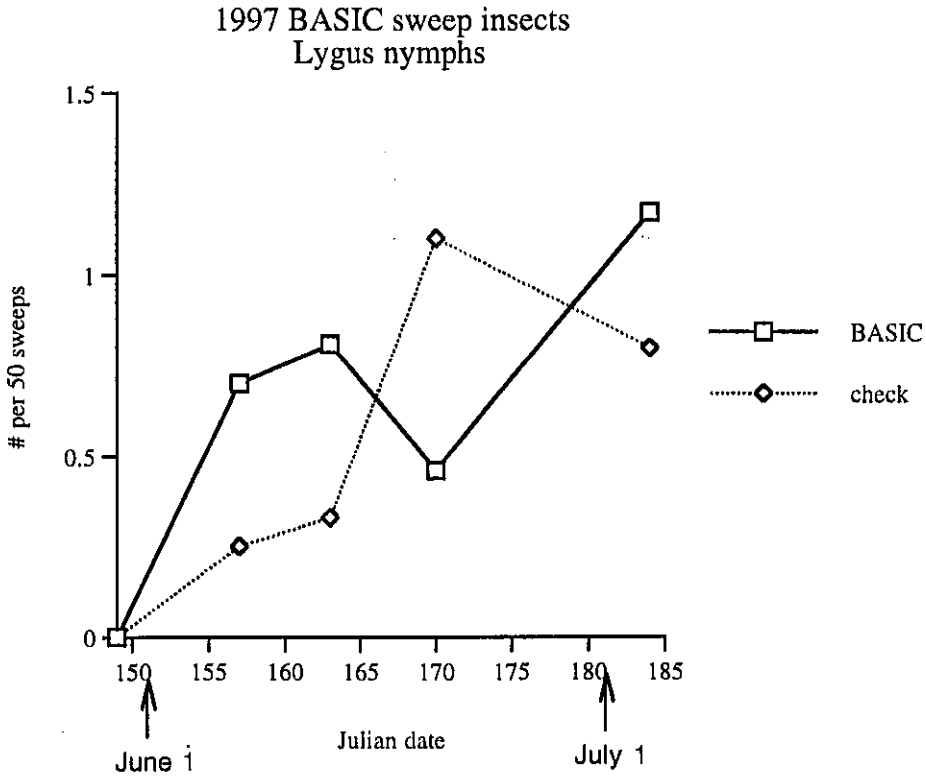
date	trtmt	rep	height	nodes	vegetative nodes	fruiting branches	nodes above white flower	top 5 retent.	bottom 5 retent.
6/3	B	1	11.60	10.45	5.40	5.05			2.90
6/3	B	2	4.13	5.95	4.78	1.44			1.25
6/4	B	3	2.93	5.40	6.00	1.33			1.33
6/4	B	4	4.78	6.70	4.53	2.27			1.33
6/12	B	5	16.70	10.05	3.95	6.10			2.84
6/5	B	6	6.50	6.95	4.60	1.85			
6/5	B	7	4.63	5.75	3.65	0.80			
6/12	B	8	18.58	11.20	3.85	7.00			2.40
6/5	B	9	10.23	9.45	4.20	5.25			3.87
6/4	B	10	4.50	6.05	5.80	1.00			
6/4	B	11	5.03	6.55	6.10	1.20			
6/7	B	12	11.75	10.80	5.70	5.10			3.71
6/13	C	1	15.73	10.45	4.35	6.32			3.71
6/13	C	2	13.75	9.80	4.25	5.55			1.88
6/13	C	3	12.78	8.60	4.95	3.65			4.00
6/5	C	4	6.48	7.30	4.20	2.80			
6/5	C	5	11.23	9.15	4.40	4.75			3.62
6/13	C	6	15.68	11.00	4.25	6.75			3.05
6/5	C	7	12.38	9.70	4.95	4.65			3.10
6/13	C	8	14.95	9.85	4.25	5.84			3.06
6/5	C	9	10.53	8.85	4.45	4.30			3.86
6/12	C	10	5.65	6.05	5.17	1.33			
6/12	C	11	8.70	7.55	5.63	1.95			
6/13	B	1	16.00	13.30	5.65	6.05			4.12
6/14	B	2	7.69	8.40	6.10	2.30			5.00
6/14	B	3	6.48	8.15	6.15	3.15			
6/14	B	4	6.18	7.40	5.00	2.40			5.00
6/18	B	5	18.23	11.10	4.15	6.95	6.00		2.58
6/18	B	6	10.65	9.30	5.20	4.10			4.43
6/18	B	7	11.48	10.45	6.05	2.90			1.00
6/18	B	8	19.80	13.80	3.75	8.40		3.00	2.15
6/19	B	9	17.60	13.25	4.40	7.35		5.00	4.47
6/14	B	10	8.18	8.40	5.78	2.41			
6/20	B	11	10.35	10.15	6.10	4.05			4.33
6/14	B	12	13.23	13.20	4.95	6.60	7.40	4.00	4.00
6/19	C	1	20.10	11.75	4.15	7.35	8.50	5.00	3.70
6/19	C	2	16.60	15.85	4.60	6.45	5.00		3.10
6/20	C	3	15.13	9.90	5.05	4.85			4.09
6/19	C	4	14.73	10.75	4.85	5.90	7.00		3.94
6/20	C	5	18.33	13.55	4.70	7.35	7.00		3.80
6/19	C	6	31.80	12.20	4.75	7.45	7.00		2.85
6/20	C	7	20.75	12.55	5.20	7.35	7.00	3.00	4.15
6/20	C	8	21.70	12.35	4.10	8.30		4.50	2.30
6/19	C	9	18.05	11.45	4.50	6.95			3.35
6/20	C	10	7.08	7.75	5.95	1.85			
6/20	C	11	13.60	9.20	5.95	3.50	1.00		2.50

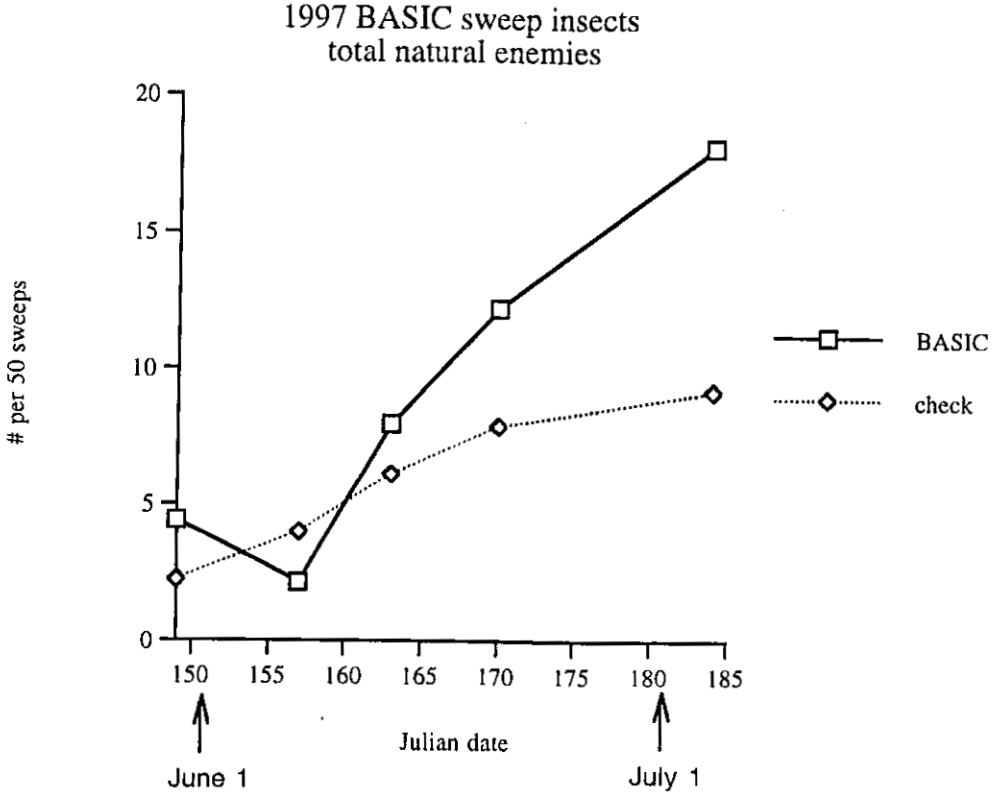
date	trtmt	rep	height	nodes	vegetative nodes	fruiting branches	nodes above white flower	top 5 retent.	bottom 5 retent.
6/21	B	1	21.40	13.45	5.75	7.70			3.95
6/21	B	2	11.38	11.05	6.25	4.65			4.23
6/24	B	3	12.65	11.70	7.45	4.25			
6/26	B	4	14.48	11.85	5.55	6.30			4.72
7/1	B	5	29.80	14.65	3.80	10.85	6.88		1.75
7/3	B	6	16.65	11.80	5.15	6.65			4.05
7/2	B	7	18.48	11.75	5.80	5.95			3.65
7/1	B	8	26.85	13.80	3.85	9.95		4.67	3.30
6/26	B	9	19.48	12.80	5.00	7.45		5.00	4.20
6/26	B	10	15.35	11.70	6.47	4.89			
6/27	B	11	14.45	11.55	6.05	5.50			4.59
6/21	B	12	18.60	13.85	5.35	8.50	7.33	4.00	4.65
7/3	C	1	25.70	14.15	4.00	10.15	6.09	4.93	3.60
7/3	C	2	20.30	12.75	4.10	8.65	5.00		2.60
7/3	C	3	22.90	12.50	5.10	7.40			3.30
7/2	C	4	21.75	12.70	4.75	7.90	6.73		4.40
7/2	C	5	27.58	14.45	4.50	9.95	6.00		3.00
7/3	C	6	25.90	14.50	4.65	9.85	5.17		2.95
7/2	C	7	26.53	14.25	5.40	8.85	6.50	4.83	3.60
7/2	C	8	26.60	13.35	4.35	9.10		4.88	3.15
6/27	C	9	19.33	12.25	4.35	7.90			3.45
7/3	C	10	15.23	10.15	5.60	4.55			
7/1	C	11	20.50	11.80	6.50	5.15			2.56

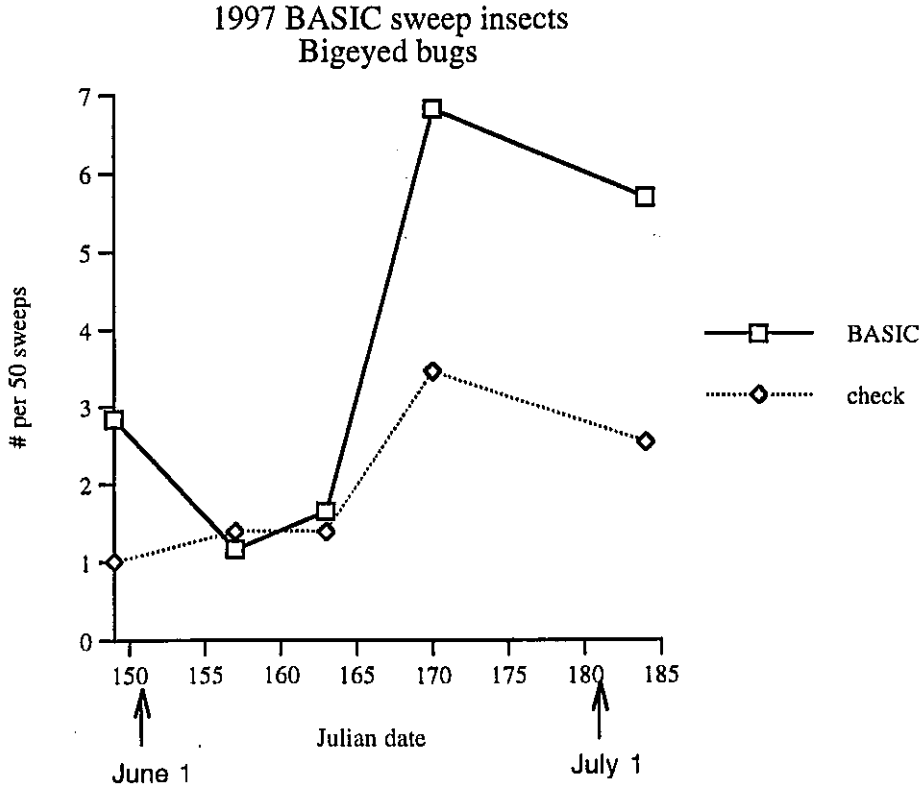
date	trtmt	rep	mites	mite eggs	thrips	aphids	minute pirate bugs	lacewing eggs	bigeyed bug eggs	total beneficials
6/3	B	1	1.15	1.05	1.45	1.05	0.10	0.00	0.00	0.10
6/3	B	2	1.00	1.00	1.60	1.00	0.00	0.05	0.00	0.05
6/4	B	3	1.00	1.00	1.40	1.15	0.00	0.00	0.00	0.00
6/4	B	4	1.05	1.05	1.20	1.00	0.00	0.00	0.05	0.05
6/12	B	5	1.30	1.20	1.25	1.00	0.05	0.00	0.10	0.15
6/5	B	6	1.60	1.50	2.05	1.05	0.00	0.00	0.00	0.00
6/5	B	7	1.10	1.10	1.65	1.05	0.00	0.05	0.05	0.10
6/12	B	8	1.15	1.10	1.30	1.00	0.00	0.05	0.15	0.20
6/5	B	9	1.00	1.00	1.30	1.00	0.00	0.00	0.00	0.00
6/4	B	10	1.05	1.05	1.35	1.00	0.00	0.00	0.00	0.00
6/4	B	11	1.05	1.00	1.15	1.00	0.00	0.00	0.00	0.00
6/7	B	12	1.10	1.05	1.20	1.00	0.05	0.00	0.00	0.05
6/13	C	1	1.40	1.20	2.00	1.00	0.00	0.00	0.00	0.00
6/13	C	2	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00
6/13	C	3	1.00	1.00	1.20	1.00	0.00	0.05	0.00	0.05
6/5	C	4	1.50	1.45	2.35	1.00	0.00	0.00	0.00	0.00
6/5	C	5	1.40	1.35	1.65	1.00	0.10	0.05	0.10	0.25
6/13	C	6	1.00	1.00	1.25	1.00	0.05	0.00	0.00	0.05
6/5	C	7	1.10	1.10	1.50	1.00	0.00	0.10	0.00	0.10
6/13	C	8	1.00	1.00	1.15	1.00	0.05	0.05	0.00	0.10
6/5	C	9	1.10	1.10	1.55	1.05	0.00	0.00	0.00	0.00
6/12	C	10	1.00	1.00	1.10	1.00	0.00	0.00	0.00	0.00
6/12	C	11	1.00	1.00	1.25	1.10	0.00	0.00	0.00	0.00
6/13	B	1	1.05	1.05	1.20	1.00	0.00	0.00	0.00	0.00
6/14	B	2	1.15	1.15	1.50	1.05	0.00	0.00	0.00	0.00
6/14	B	3	1.25	1.20	1.65	1.45	0.00	0.00	0.05	0.05
6/14	B	4	1.05	1.05	1.10	1.05	0.00	0.00	0.00	0.20
6/18	B	5	1.50	1.40	1.60	1.00	0.00	0.05	0.05	0.10
6/18	B	6	1.55	1.45	1.80	1.00	0.30	0.00	0.00	0.30
6/18	B	7	1.30	1.20	1.35	1.05	0.00	0.00	0.00	0.00
6/18	B	8	1.30	1.30	1.25	1.05	0.10	0.15	0.05	0.30
6/19	B	9	1.25	1.20	1.15	1.40	0.00	0.05	0.00	0.05
6/14	B	10	1.35	1.30	1.30	1.00	0.00	0.05	0.00	0.05
6/14	B	12	1.05	1.05	1.45	1.00	0.00	0.00	0.00	0.00
6/19	C	1	1.20	1.20	1.20	1.10	0.00	0.00	0.00	0.00
6/19	C	2	1.00	1.00	1.00	1.05	0.00	0.10	0.00	0.10
6/19	C	4	1.60	1.45	1.30	1.00	0.15	0.20	0.00	0.35
6/20	C	5	1.05	1.05	1.05	1.00	0.00	0.00	0.00	0.00
6/19	C	6	1.00	1.00	1.35	1.00	0.05	0.00	0.00	0.05
6/20	C	8	1.00	1.00	1.05	1.00	0.00	0.05	0.00	0.05
6/19	C	9	1.35	1.30	1.00	1.15	0.00	0.00	0.00	0.00

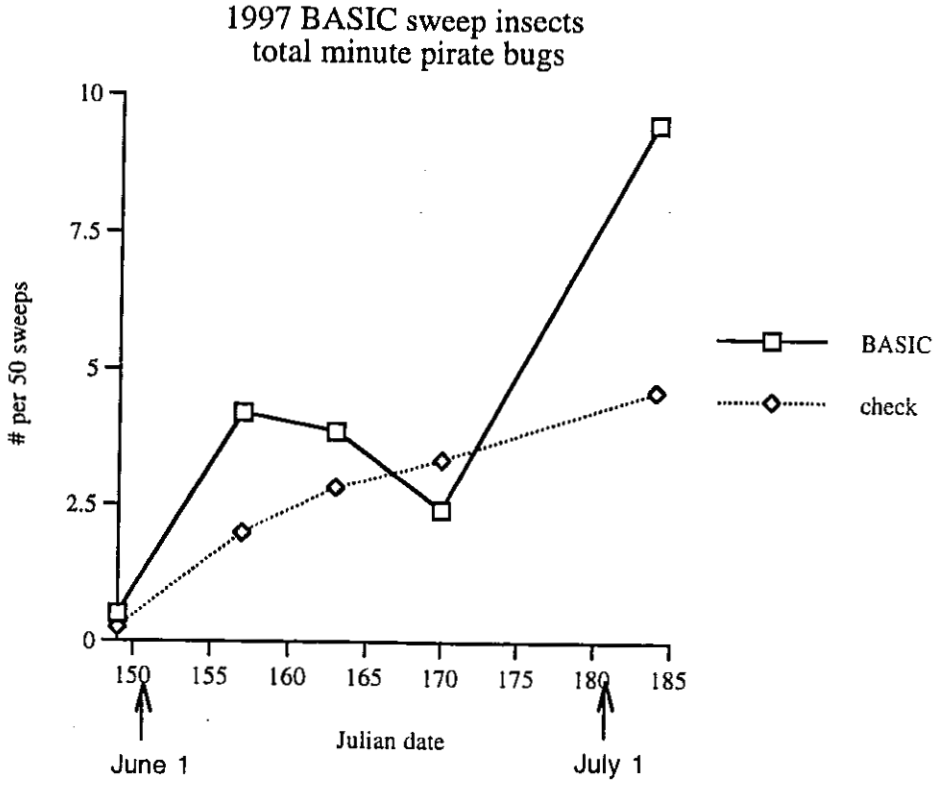
date	trtmt	rep	mites	mite eggs	thrips	aphids	pirate bugs	lacewing eggs	bigeyed bug eggs	total beneficials
6/21	B	1	1.35	1..20	1.50	1.05	0.05	0.20	0.00	0.25
6/21	B	2	1.10	1.10	1.45	1.20	0.00	0.10	0.00	0.10
6/24	B	3	1.35	1.25	1.25	1.30	0.05	0.05	0.00	0.10
6/26	B	4	1.40	1.35	1.30	1.10	0.20	0.00	0.25	0.40
7/1	B	5	1.60	1.45	1.35	1.00	0.10	0.00	0.00	0.10
7/3	B	6	1.10	1.10	1.10	1.15	0.00	0.10	0.00	0.10
7/2	B	7	1.25	1.20	1.15	1.10	0.20	0.10	0.05	0.35
7/1	B	8	1.95	1.60	1.05	1.00	0.30	0.05	0.30	0.65
6/26	B	9	1.20	1.15	1.35	1.30	0.10	0.15	0.00	0.25
6/26	B	10	1.20	1.20	1.25	1.10	0.00	0.20	0.00	0.20
6/27	B	11	1.75	1.60	1.20	1.20	0.05	0.15	0.10	0.30
6/21	B	12	1.10	1.05	1.15	1.00	0.00	0.05	0.00	0.05
7/3	C	1	1.05	1.05	1.00	1.05	0.00	0.10	0.00	0.10
7/3	C	2	1.40	1.25	1.00	1.05	0.00	0.05	0.00	0.05
7/3	C	3	1.45	1.30	1.20	1.05	0.25	0.10	0.05	0.40
7/2	C	4	1.05	1.05	1.05	1.20	0.00	0.05	0.05	0.10
7/2	C	5	1.05	1.05	1.10	1.05	0.10	0.05	0.00	0.15
7/3	C	6	1.00	1.00	1.15	1.30	0.00	0.05	0.00	0.05
7/2	C	7	1.20	1.20	1.10	1.00	0.00	0.00	0.00	0.00
7/2	C	8	1.10	1.05	1.10	1.05	0.10	0.00	0.00	0.10
6/27	C	9	1.35	1.25	1.05	1.45	0.00	0.10	0.00	0.15
7/3	C	10	1.30	1.25	1.05	1.00	0.05	0.00	0.05	0.10
7/1	C	11	1.10	1.10	1.15	1.00	0.10	0.00	0.00	0.10

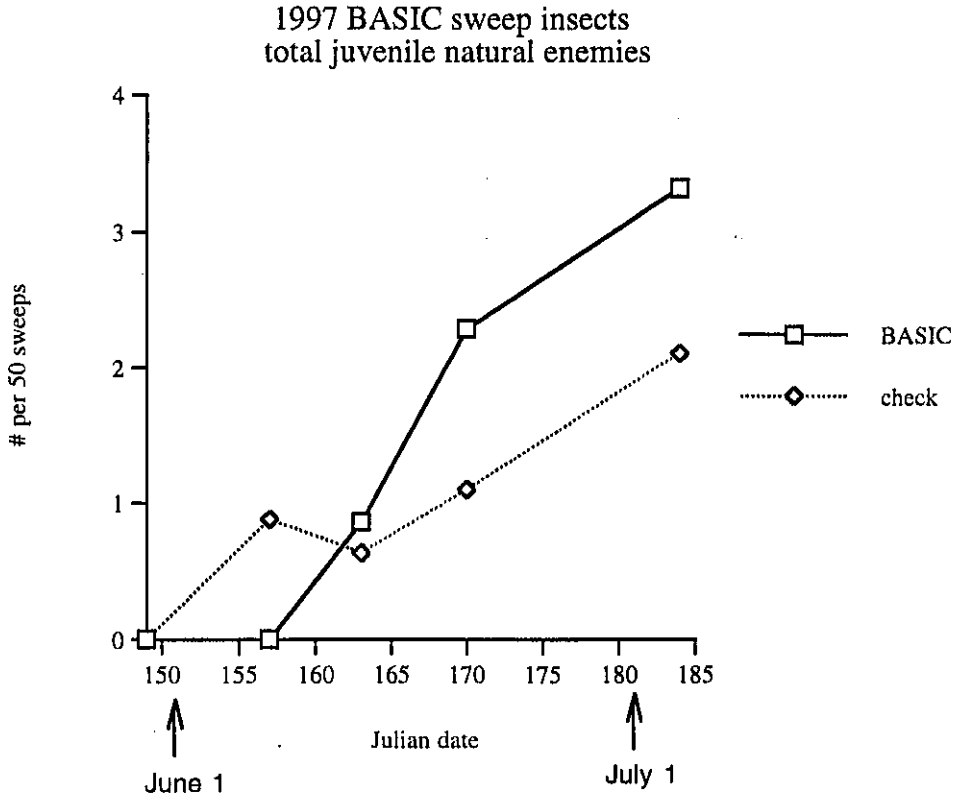

1997 BASIC sweep insects
Total Lygus
per 50 sweeps
0
1
2
3
4
150
155
160
165
170
175
180
185
Julian date
June 1
July 1
BASIC
check


1997 BASIC sweep insects
Lygus nymphs
per 50 sweeps
1.5
1
0.5
0
150
155
160
165
170
175
180
185
June 1
Julian date
July 1
BASIC
check

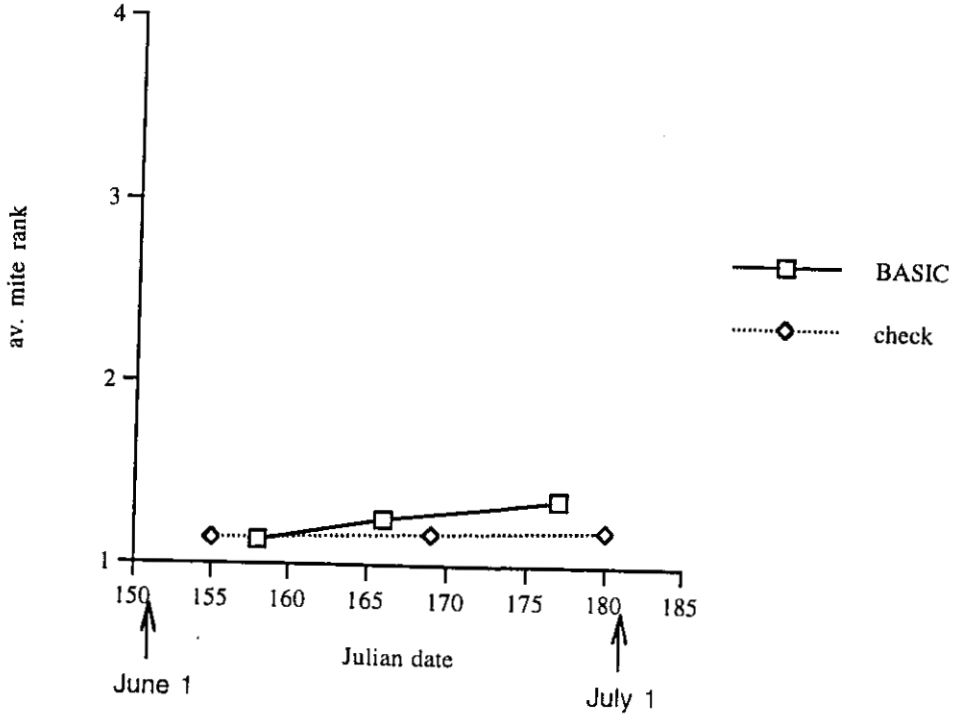

1997 BASIC sweep insects
total natural enemies
per 50 sweeps
20
15
10
5
0
150
155
160
165
170
175
180
185
Julian date
June 1
July 1
BASIC
check

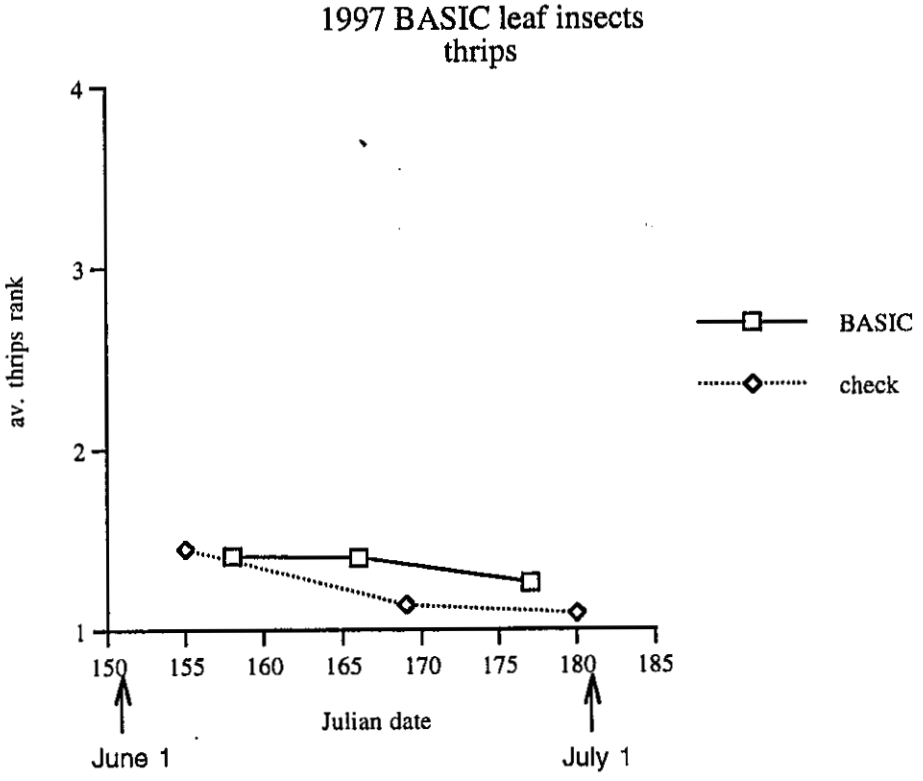

1997 BASIC sweep insects
Bigeyed bugs
per 50 sweeps
0
1
2
3
4
5
6
7
150
155
160
165
170
175
180
185
Julian date
June 1
July 1
BASIC
check


1997 BASIC sweep insects
total minute pirate bugs
10
7.5
5
2.5
0
per 50 sweeps
150
155
160
165
170
175
180
185
Julian date
June 1
July 1
BASIC
check

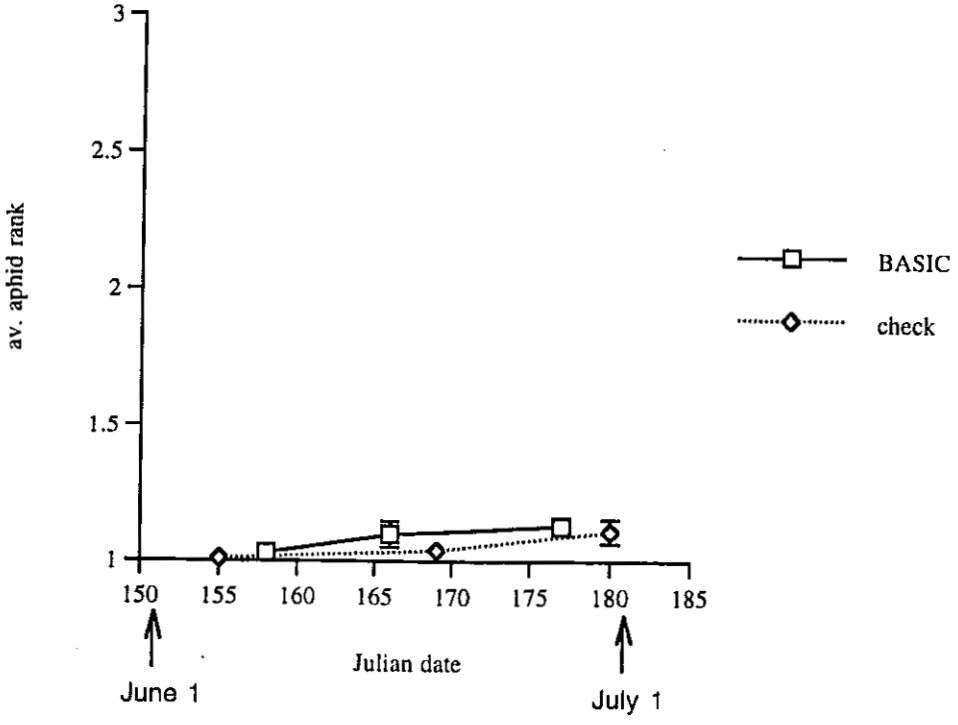

1997 BASIC sweep insects
total juvenile natural enemies
per 50 sweeps
4
3
2
1
0
150
155
160
165
170
175
180
185
Julian date
June 1
July 1
BASIC
check

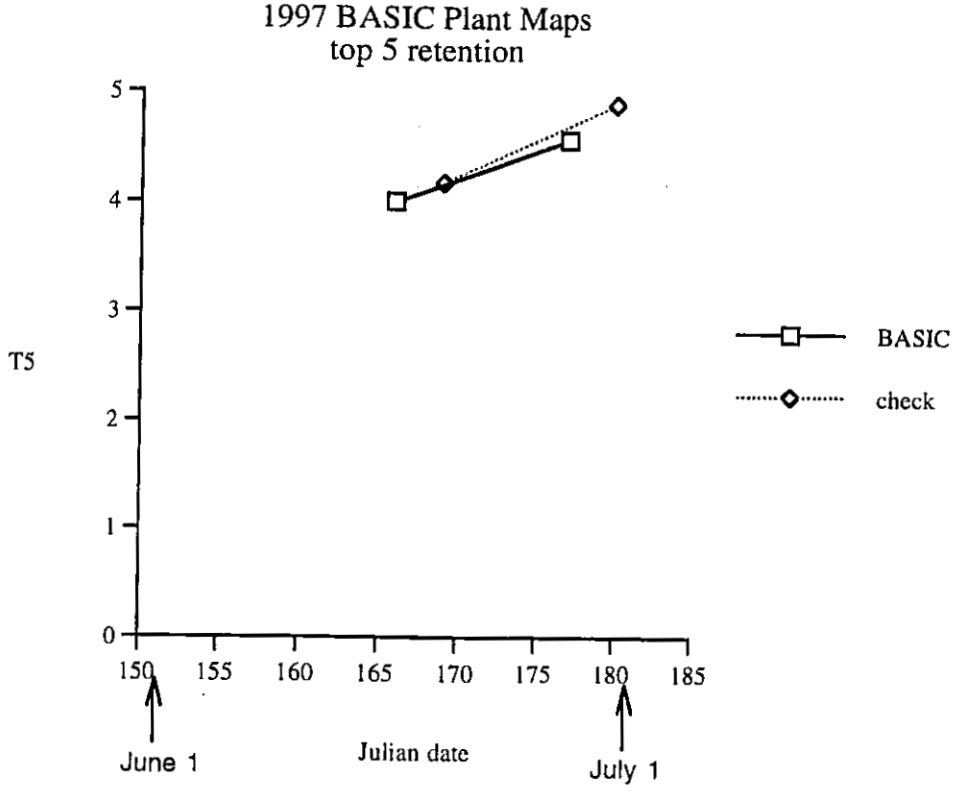
1997 BASIC Leaf Insects
mites

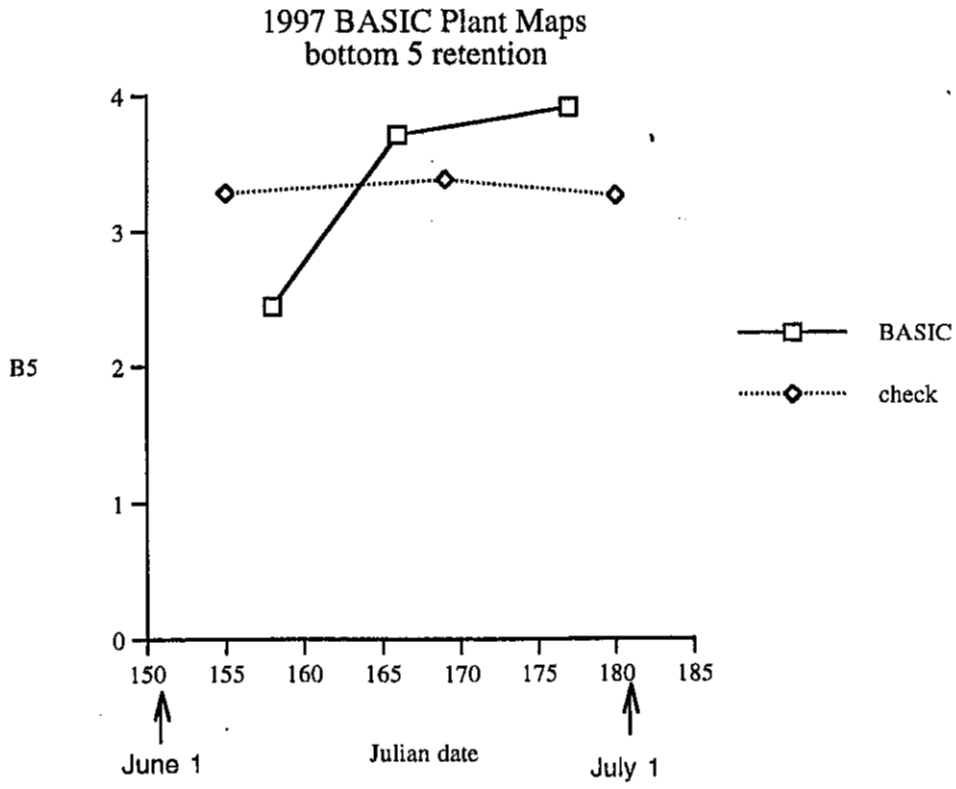


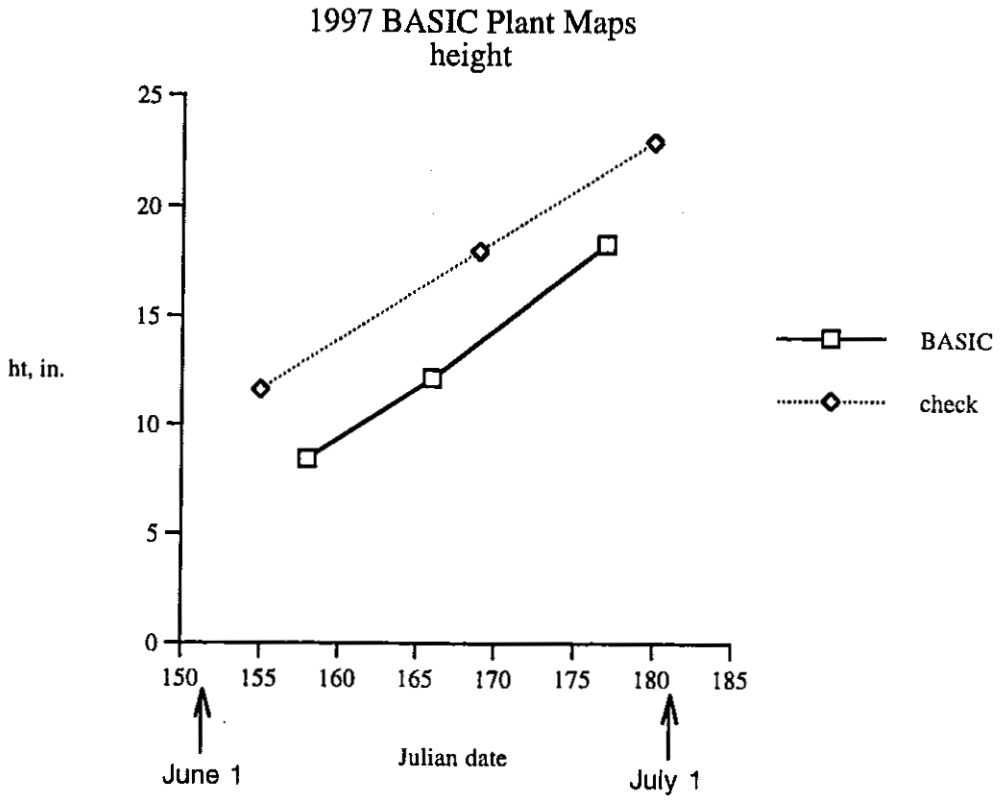

1997 BASIC leaf insects
thrips
av. thrips rank
4
3
2
1
150
155
160
165
170
175
180
185
Julian date
June 1
July 1
BASIC
check

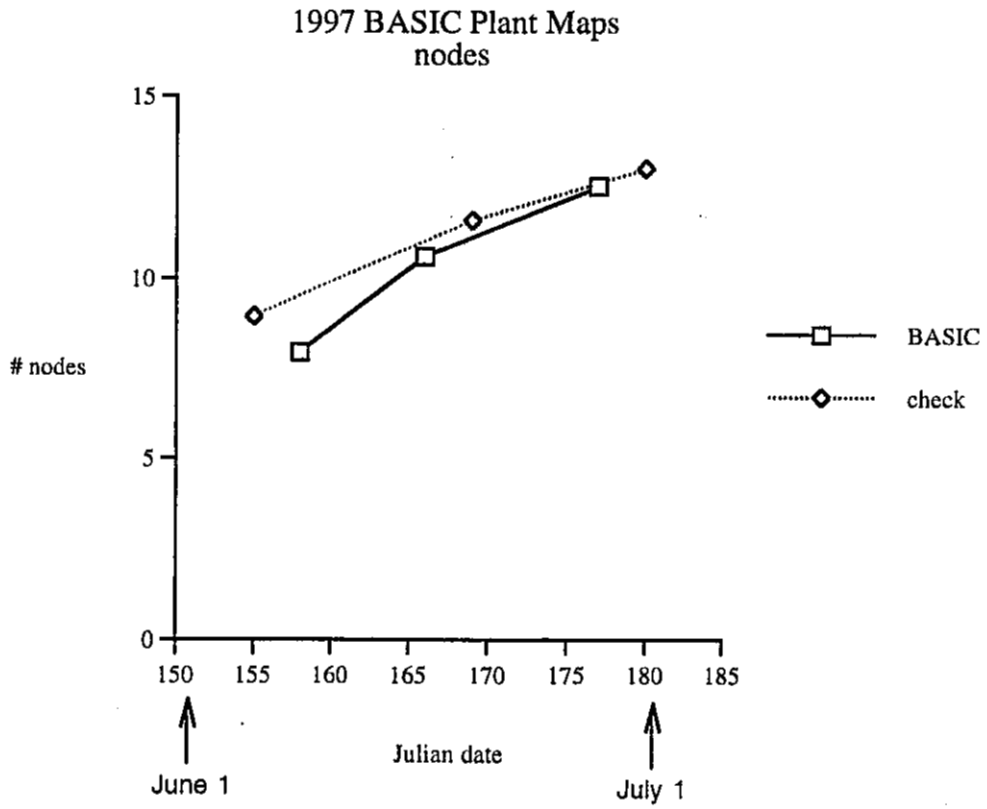
1997 BASIC leaf insects
aphids

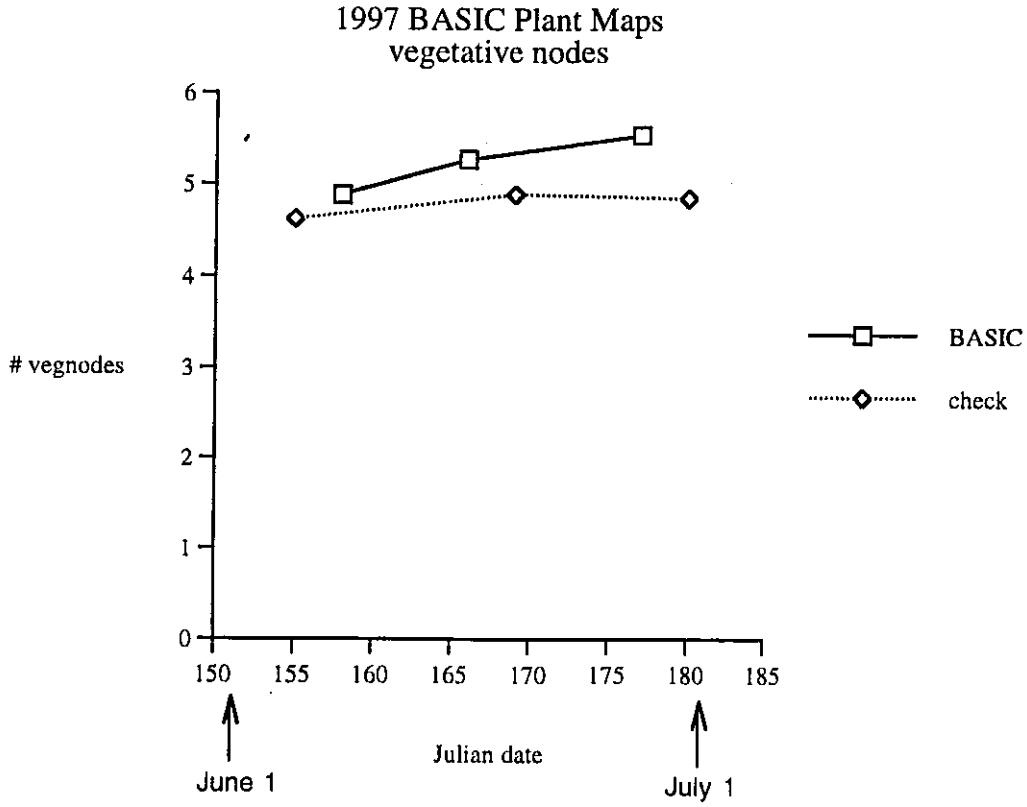


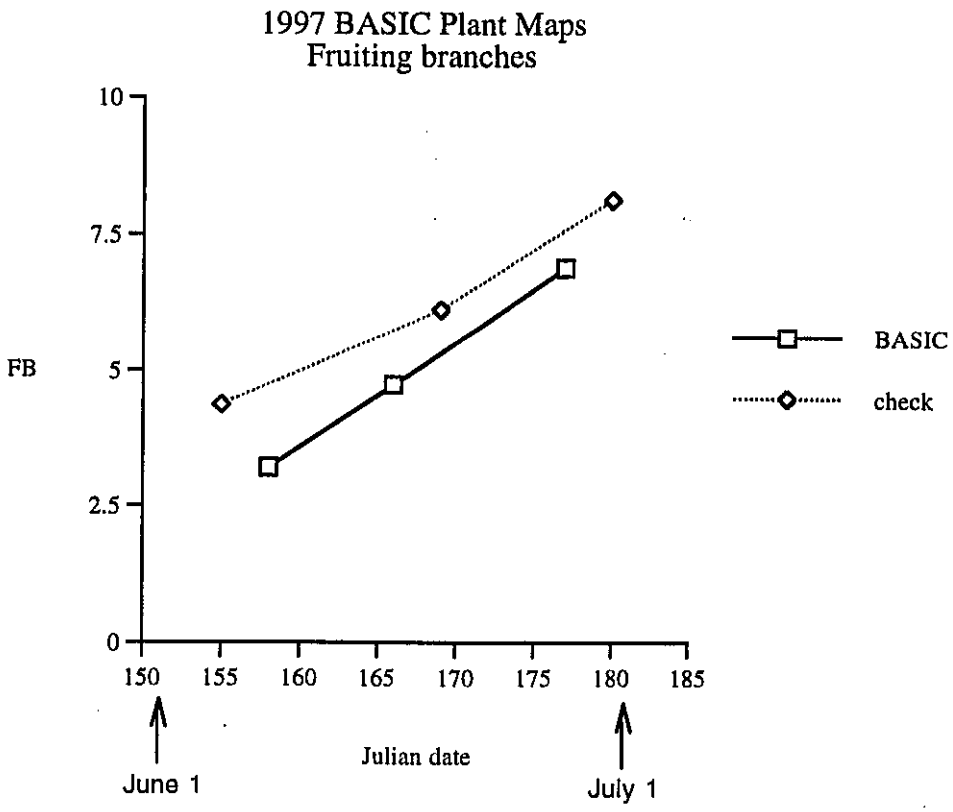

1997 BASIC Plant Maps
top 5 retention
T5
5
4
3
2
1
0
150
155
160
165
170
175
180
185
June 1
Julian date
July 1
BASIC
check

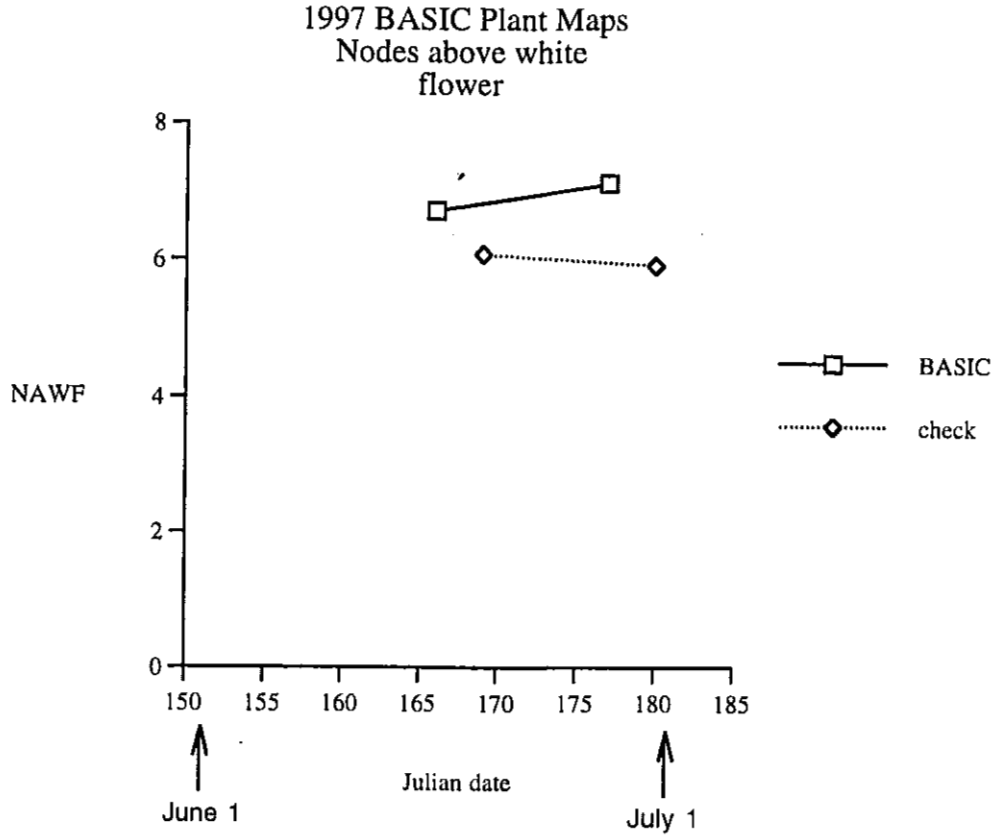

1997 BASIC Plant Maps
bottom 5 retention
B5
4
3
2
1
0
150
155
160
165
170
175
180
185
June 1
Julian date
July 1
BASIC
check


1997 BASIC Plant Maps
height
ht, in.
25
20
15
10
5
0
150
155
160
165
170
175
180
185
June 1
Julian date
July 1
BASIC
check


1997 BASIC Plant Maps
nodes
15
10
5
0
nodes
150
155
160
165
170
175
180
185
June 1
July 1
Julian date
BASIC
check


1997 BASIC Plant Maps
vegetative nodes
vegnodes
6
5
4
3
2
1
0
150
155
160
165
170
175
180
185
June 1
Julian date
July 1
BASIC
check


1997 BASIC Plant Maps
Fruiting branches
FB
10
7.5
5
2.5
0
150
155
160
165
170
175
180
185
Julian date
June 1
July 1
BASIC
check


1997 BASIC Plant Maps
Nodes above white flower
NAWF
8
6
4
2
0
150
155
160
165
170
175
180
185
Julian date
June 1
July 1
BASIC
check

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CENTER FOR AGROECOLOGY
AND SUSTAINABLE FOOD SYSTEMS

SANTA CRUZ, CALIFORNIA 95064

6 August 1997

Dear cotton growers:

Enclosed is the second set of updates from the BASIC plant mapping and insect sampling efforts, extending to the beginning of August. Fields have the same code as in the prior update. This is your code:

Code: trtmt _____ rep: _____

Tables: Each number on the tables represents an *average*. For the sweep net samples, each number is an average of four 50-sweep samples on each date in each field. For the plant map samples and the leaf insect samples, each number is an average of 20 plants or 20 leaves on each date in each field. We have added a column for percent mite infestation. Some fields have not been sampled every week. Wet fields, fields that have been sprayed, and sometimes time constraints prevent us from reaching every field each week. These tables are not intended to substitute for pest control information and recommendations made by a licensed pest control advisor.

Graphs: Graphs show a picture of averages for each treatment (BASIC or check), to give you an idea of how the two treatments are performing overall in time. The horizontal axis goes from June 1 to August 1. For the sweep net sample graphs, the vertical axis is the average number of insects per 50 sweeps with a sweep net. For the leaf insects (mites, thrips, and aphids), the vertical axis is an insect rank (a value of 1 corresponds to no insects, 2 means up to 10 insects, 3 means up to 100 insects, and 4 means over 100 insects per leaf).

What do the graphs mean? Mite, thrips and aphid populations have remained very low through July. Lygus populations have risen substantially in the last few weeks. However, these numbers are no longer crucial, as fields are past the critical periods of new square initiation and development. Beneficial insect numbers (mostly bigeyed bugs and minute pirate bugs) have remained high in both BASIC and check fields.

BASIC and check fields have maintained good retention of the bottom five fruiting positions. Top five retentions are beginning to decrease as plants go into cutout. BASIC fields have caught up with check fields in node number and number of fruiting branches, but remain very slightly behind check fields in terms of plant height. The season is clearly going to be an early one, as most of the fields are in, or close to, cutout as of the beginning of August.

If you have any questions about these graphs or charts, please feel free to contact Sean Swezey at (408) 459-4367, or come to our next breakfast meeting, which will be announced in the mail.

Sincerely,

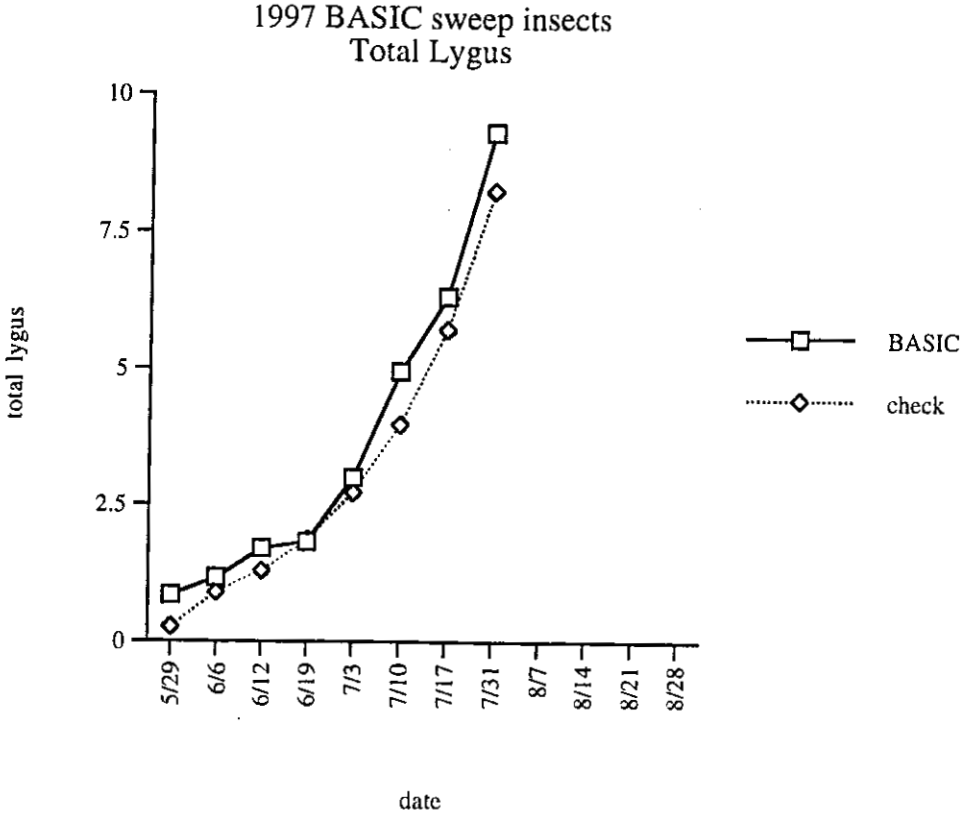
Sean L. Swezey and Polly Goldman
Center for Agroecology and Sustainable Food Systems
University of California
Santa Cruz, CA 95064
(408) 459-4367

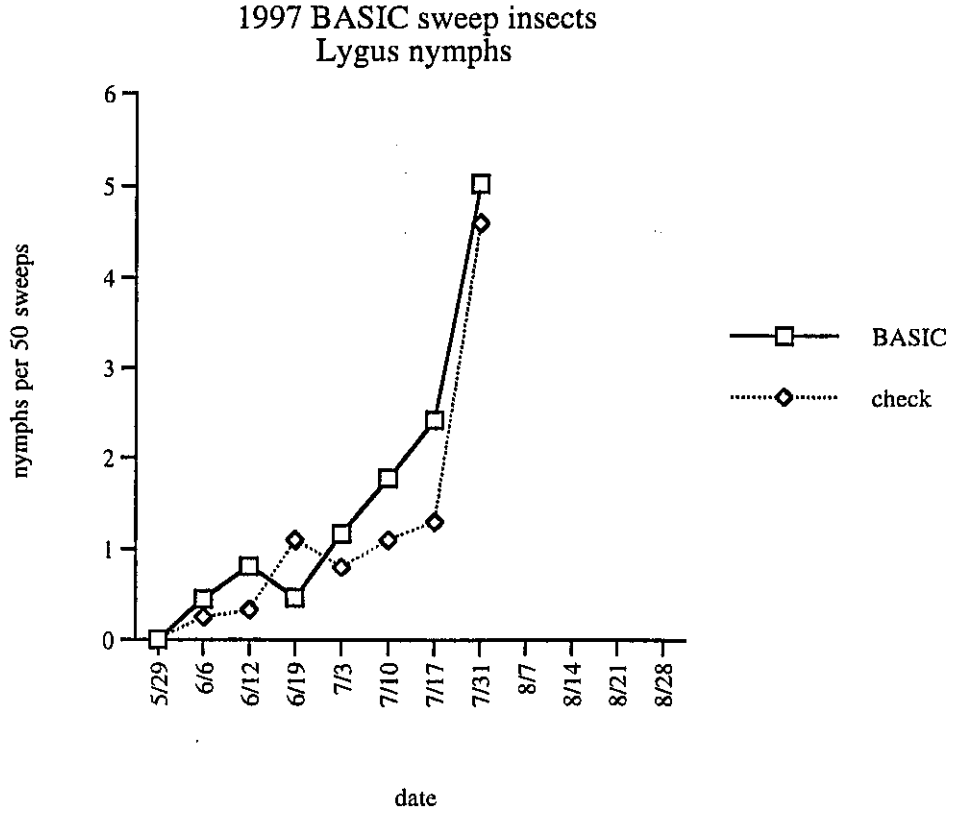
date	trtmt	rep	lygus	bigeyed bugs	minute pirate bugs	damsel bugs	assassin bugs	ladybird beetles	lacewing	spiders	All juveniles	All beneficials
5/29	B	1	0.5	1.5	1	0	0	0.25	0	0.5	0	3.25
5/29	B	11	1.5	2	0	0	0	0.25	0	0	0	2.25
5/29	B	12	0.5	5	0.5	0.5	0	0.25	0.25	1.25	0	7.75
5/29	C	6	0.25	1	0.25	0.75	0	0	0	0.25	0	2.25
6/6	B	1	1.5	7.5	5.25	0.5	0	0.75	0	0.5	3.75	14.5
6/6	B	5	2.5	5.5	5.25	0	0	1	0	0.5	3	12.25
6/6	B	6	1.75	2.75	5.25	0.25	0	4.5	0	0.5	4	13.25
6/6	B	10	0	1	0.5	0	0	0.25	0	0.75	0	2.5
6/6	B	12	0	4.25	0	0.5	0	0.25	0	1.25	0	6.25
6/6	C	2	0.25	1.5	0	0	0	0	0	0	0	1.5
6/6	C	3	1.5	1.25	4	0	0	0.25	0	1	1.75	6.5
6/12	B	2	0.5	1.5	0	0	0	1	0	0.75	0	3.25
6/12	B	4	0.5	1.25	2.75	0	0	1	0	2.25	0.75	7.25
6/13	B	5	3	0.75	9	0	0.25	0.5	0	0.5	0.5	11
6/13	B	6	2.75	1.25	3.75	1.5	0.25	3	0.75	1.25	1	11.75
6/13	B	7	2.5	2.5	3.5	1.25	0.5	0	0.25	1.5	0.25	9.5
6/13	B	8	3.5	4.25	3.75	0.5	0	0	0	0.75	2.5	9.25
6/13	B	9	2	1	12	0	0.25	0.5	0.25	0.75	1.5	14.75
6/12	B	11	0	1.25	0	0	0	0.25	0.25	0.5	0.5	2.25
6/12	B	12	0.5	1	0	0.75	0	0	0.25	0.75	0.75	2.75
6/13	C	1	0	1.25	1.75	0	0	0	0.25	2.75	0.5	6
6/13	C	2	0.5	0	3.25	0	0	0	0	0	0	3.25
6/13	C	4	0.75	4	0.5	0.75	0	0	0	0.5	0.75	5.75
6/13	C	5	2	0.75	4.75	0	0.25	0.5	0	0.75	0.75	7
6/12	C	6	1.25	2	1.75	0	0	0.25	0.75	1	1.5	5.75
6/13	C	7	3	1	3.5	1	1.25	1	0	1.5	0.5	9.25
6/13	C	8	1.25	1.75	3.75	0.25	0.25	1.5	0	2	0.75	9.5
6/13	C	9	0.25	0.5	0.25	0	0	0	0	0.5	0	1.25
6/12	C	10	1.75	1.5	5	0.5	0	0	0.75	0.25	1.25	8
6/12	C	11	2	1	3.75	0.25	0	0.25	0.25	0	0.25	5.5

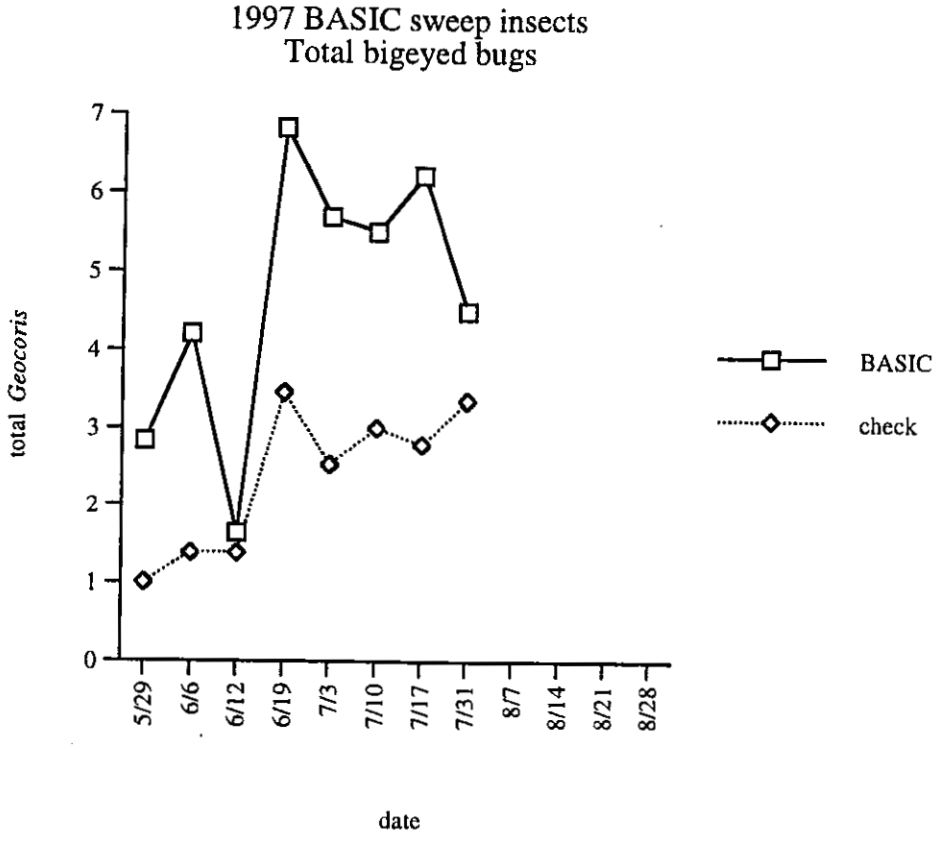
date	trtmt	rep	lygus	bigeyed bugs	minute pirate bugs	damsel bugs	assassin bugs	ladybird beetles	lacewing	spiders	All juveniles	All beneficials
6/19	B	1	3	11.75	4.5	1.25	0	0.75	0.25	0.25	4	18.75
6/19	B	2	0.75	10.25	1	0.5	0.25	1.25	0.25	0	2.5	13.5
6/19	B	3	0	4.75	1.25	0	0	7	0	0	5	13
6/19	B	4	0.5	2.25	1.75	0.5	0	1.5	0	1	0	7
6/19	B	6	2.5	5.75	2	1.5	0.25	0.75	0	0	1.75	10.25
6/19	B	10	4	6.75	2.75	1	0	0.25	0.5	0	0.25	11.25
6/20	B	12	2	6.25	3.75	0	0	0.25	0.75	0.75	2.5	11.75
6/19	C	1	1.5	2.25	3.75	0	0.5	0	0.75	0	1.5	7.25
6/19	C	2	0.5	1.75	2.5	0	0.75	0	0	0	0	5
6/19	C	3	2.75	4	7.25	0.75	0.25	0.5	0.75	0.25	1.75	13.75
6/19	C	6	2	4	1	0	0	0	0.25	0	1.25	5.25
6/19	C	10	2.5	5.25	2.25	0.25	0	0	0	0.5	1	8.25
7/3	B	3	3	12.75	11	0.5	0.25	1.75	0.75	1.5	5	28.5
7/1	B	5	3.25	3	10	0.25	0	0	1	2.25	3	16.5
7/3	B	6	5.75	13.25	7.75	0.5	0.5	0	0	2.5	6	24.5
7/3	B	7	3	3.25	15.25	1.25	0	0	0.5	0.75	2	21
7/1	B	8	3.25	5.75	10.5	0.25	0.25	0.5	0	2	4.5	19.25
7/1	B	9	2.75	1.75	12	1	0	0.5	0.75	1	2.75	17
7/3	C	1	2	3	6	0	0.5	0.25	1	1	1	11.75
7/3	C	2	0	1	0.75	0	0.25	0	0.25	0	0	2.25
7/1	C	3	4	2.25	3.5	0	0.25	0.25	0	1.75	2	8
7/1	C	4	2.25	6.5	6.5	0.75	0.25	0	0.75	0	4.75	14.75
7/1	C	5	3.5	1.25	3	0	0.75	0	0.25	0.75	1.5	6
7/1	C	7	3.5	1.25	4.5	0.25	0.5	0	0.5	0.5	2	7.5
7/1	C	8	1.75	0.75	4.5	0	0	0	0.75	1.5	2.75	7.5
7/1	C	9	4	1.25	5.5	0.5	0	0	2	0	2	9.25
7/1	C	11	3.5	5.5	7.25	1.5	0	0	0	1.25	3	15.5

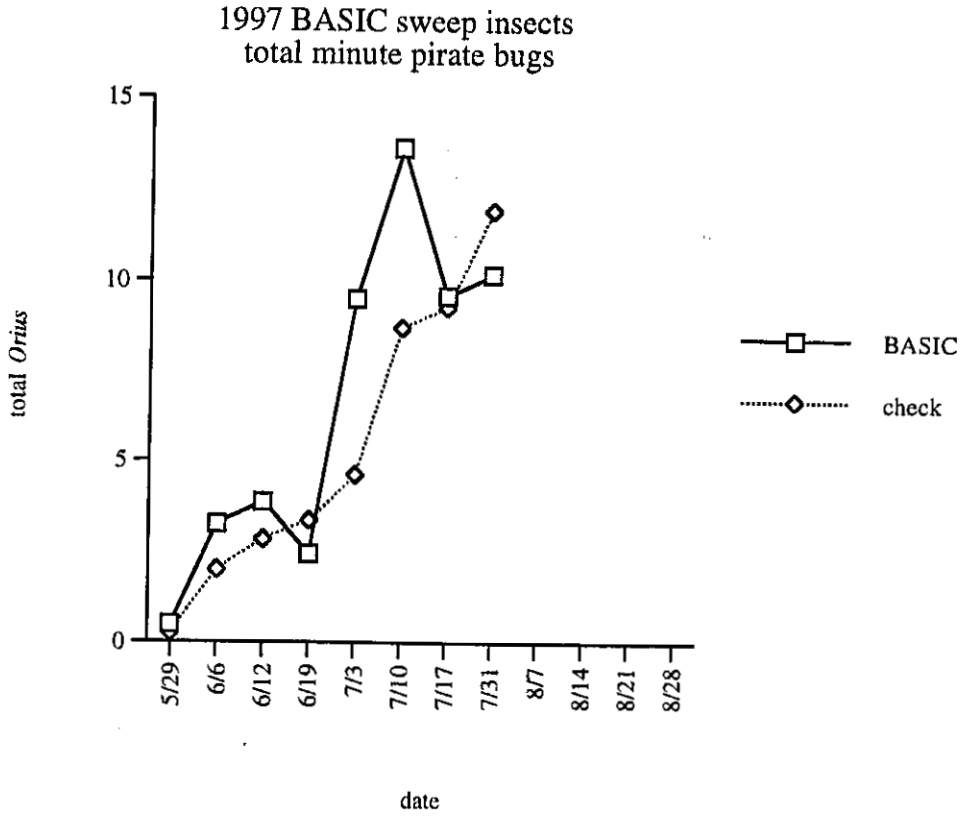
date	trtmt	rep	lygus	bigeyed bugs	minute pirate bugs	damsel bugs	assassin bugs	ladybird beetles	lacewing	spiders	All juveniles	All beneficials
7/10	B	1	4.00	9.50	15.00	0.50	0.25	0.00	0.25	0	7.25	25.50
7/10	B	2	1.00	2.50	14.75	0.00	1.00	0.50	0.00	0.25	1.25	19.00
7/10	B	3	4.75	9.25	20.25	1.50	0.50	0.75	0.25	0.5	4.50	33.00
7/10	B	4	3.25	4.00	16.50	0.25	0.25	0.00	0.00	0.75	3.00	21.75
7/11	B	5	7.00	6.00	20.50	1.25	0.00	0.00	0.00	0.75	2.25	28.50
7/15	B	6	4.75	8.25	3.25	2.25	0.25	0.00	0.00	0.5	3.25	14.50
7/11	B	7	3.50	1.25	11.75	0.50	0.25	0.25	0.25	0	2.50	14.25
7/11	B	8	8.25	7.25	16.50	0.50	0.00	0.25	0.25	0	5.75	24.75
7/15	B	9	4.50	1.50	10.00	0.50	0.25	0.00	0.00	0.5	1.50	12.75
7/10	B	10	6.00	3.25	8.75	1.00	0.25	0.50	0.00	1.67	1.25	15.00
7/11	B	11	7.50	7.75	12.50	0.50	1.25	0.00	1.75	0.25	10.00	24.00
7/10	C	1	5.25	4.00	15.75	0.75	0.00	2.50	0.50	0.25	4.00	23.75
7/15	C	2	4.50	1.50	4.25	0.00	0.00	0.25	1.00	0	1.25	7.00
7/11	C	3	4.75	4.75	4.75	0.50	0.00	0.25	0.50	0.75	1.75	11.50
7/11	C	4	1.00	3.50	1.25	0.00	0.00	0.00	0.00	0	1.00	4.75
7/15	C	6	9.25	4.25	12.25	0.75	0.25	1.00	0.25	0.75	2.25	19.50
7/11	C	7	2.00	2.50	17.00	0.00	0.00	0.00	0.00	0.25	3.50	19.75
7/11	C	8	1.25	1.00	10.50	0.50	0.25	0.00	0.50	0.5	2.25	13.25
7/15	C	9	2.50	2.50	10.25	0.00	0.00	0.25	3.00	0	2.25	16.00
7/11	C	10	5.75	1.50	6.00	0.25	0.25	0.00	0.00	0.75	1.25	8.75
7/11	C	11	3.50	4.50	4.75	1.00	0.00	0.00	0.25	1	2.50	11.50
7/17	B	1	12.50	5.75	9.25	0.50	0.00	0.00	1.50	0.25	3.25	17.25
7/17	B	2	2.25	8.25	7.25	0.50	0.00	0.00	0.25	0	4.00	16.25
7/17	B	3	1.75	2.00	7.25	0.50	0.25	0.25	0.25	0	0.50	10.50
7/18	B	5	9.25	2.75	15.00	0.50	0.00	0.75	0.75	0.5	3.00	29.25
7/18	B	6	3.00	13.00	3.50	2.00	0.50	0.00	0.50	0.25	8.25	19.75
7/18	B	8	13.75	9.75	14.75	0.00	0.50	0.00	0.50	1	4.50	26.50
7/17	B	9	5.75	1.75	8.50	0.25	0.50	0.00	0.50	1	2.25	12.50
7/17	B	10	5.00	7.50	5.00	1.75	0.00	0.50	0.50	0	5.50	15.25
7/17	B	11	3.50	5.25	15.75	0.50	0.50	2.25	3.00	0	11.75	27.25

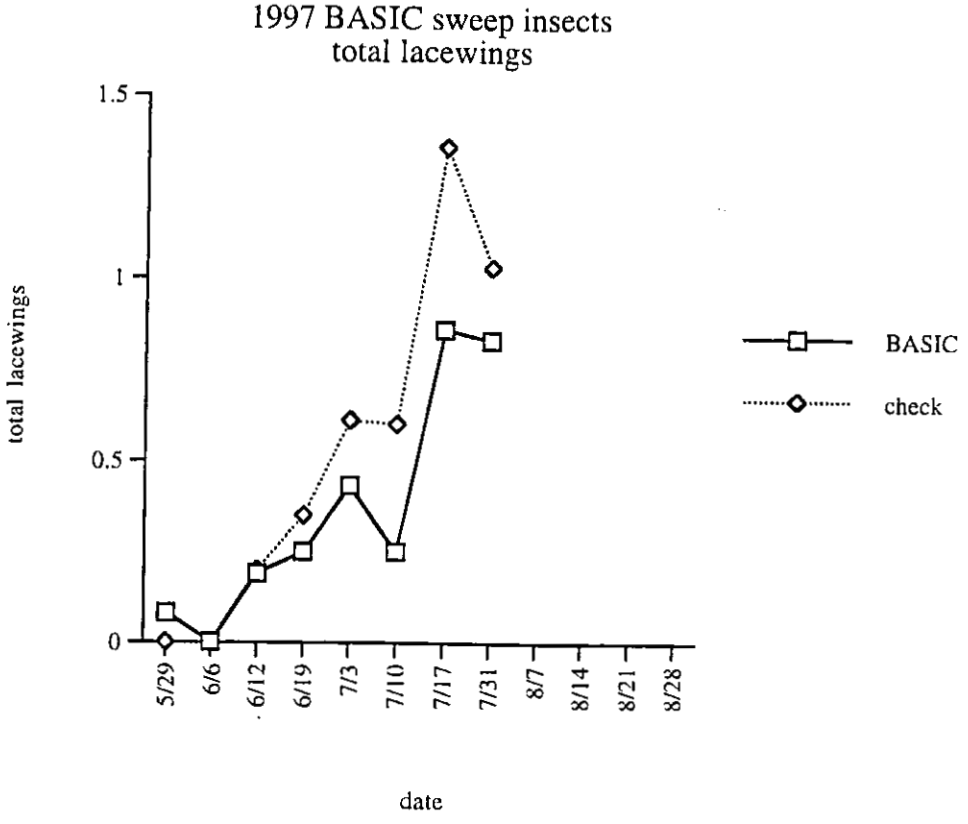
date	trtmt	rep	lygus	bigeyed bugs	minute pirate bugs	damsel bugs	assassin bugs	ladybird beetles	lacewing	spiders	All juveniles	All beneficials
7/18	C	1	8.00	3.00	11.50	0.75	0.00	6.50	1.50	1.5	11.00	24.75
7/18	C	2	4.75	3.25	5.75	0.50	0.25	4.00	1.50	0	6.50	15.25
7/18	C	6	8.75	2.25	6.00	0.25	0.00	0.50	0.00	0	0.75	9.00
7/18	C	8	4.00	1.50	18.75	0.00	0.75	0.25	0.25	0	6.50	21.50
7/18	C	9	4.75	1.25	6.75	0.00	0.00	1.00	5.75	0	5.00	14.75
7/17	C	10	5.25	2.50	9.50	0.50	0.25	0.00	0.00	0.25	1.00	13.00
7/17	C	11	4.50	5.75	6.50	0.75	0.00	0.00	0.50	1.25	3.00	14.75
7/31	B	1	13.25	3.50	13.50	1.25	0.25	0.50	0.00	0.5	3.25	19.50
7/31	B	2	11.00	7.00	12.25	0.25	0.00	1.25	0.75	0	5.25	21.50
7/31	B	3	10.25	3.50	2.75	0.75	0.25	6.00	0.00	1	4.75	14.25
7/31	B	5	9.25	3.75	9.50	0.25	0.00	0.00	0.00	0.75	5.25	14.25
8/1	B	6	8.25	11.25	14.25	0.50	0.25	0.75	0.75	0.25	9.50	28.00
8/1	B	7	6.75	0.75	9.75	0.00	0.25	0.00	1.50	0	3.25	12.25
7/31	B	8	6.50	4.75	6.50	0.50	0.00	0.00	0.00	0.5	3.00	12.25
8/1	B	9	12.00	2.75	10.25	0.50	0.25	0.50	0.75	0.75	5.00	15.75
7/31	B	10	6.50	4.00	9.75	1.25	0.00	1.25	2.00	0.5	3.75	18.75
7/31	B	11	9.25	3.75	13.00	0.00	0.25	8.75	2.50	0.25	7.75	28.50
8/1	C	1	6.50	2.75	27.50	0.00	0.00	1.00	1.50	0.75	8.00	33.50
8/1	C	2	14.00	3.75	13.50	0.50	0.50	0.50	0.75	0.25	6.00	19.75
7/31	C	3	9.75	1.25	3.75	0.50	0.25	4.00	0.50	1	5.00	11.25
7/31	C	4	4.50	8.75	9.50	0.50	0.25	0.00	0.50	0.25	6.75	19.75
8/1	C	6	7.25	3.50	12.75	0.00	0.50	1.25	2.00	0.75	5.50	20.75
8/1	C	7	8.00	1.00	9.50	0.00	2.00	0.00	1.00	1	5.50	14.50
7/31	C	8	4.00	0.50	9.00	0.00	0.25	0.00	0.00	0.5	3.75	10.25
8/1	C	9	11.50	7.50	17.75	0.00	0.25	0.50	2.25	0	7.50	28.25
7/31	C	10	12.50	2.00	9.25	0.50	0.75	0.25	1.75	0	2.50	14.50
7/31	C	11	4.25	2.50	6.75	2.50	0.25	0.50	0.00	0	1.75	12.50

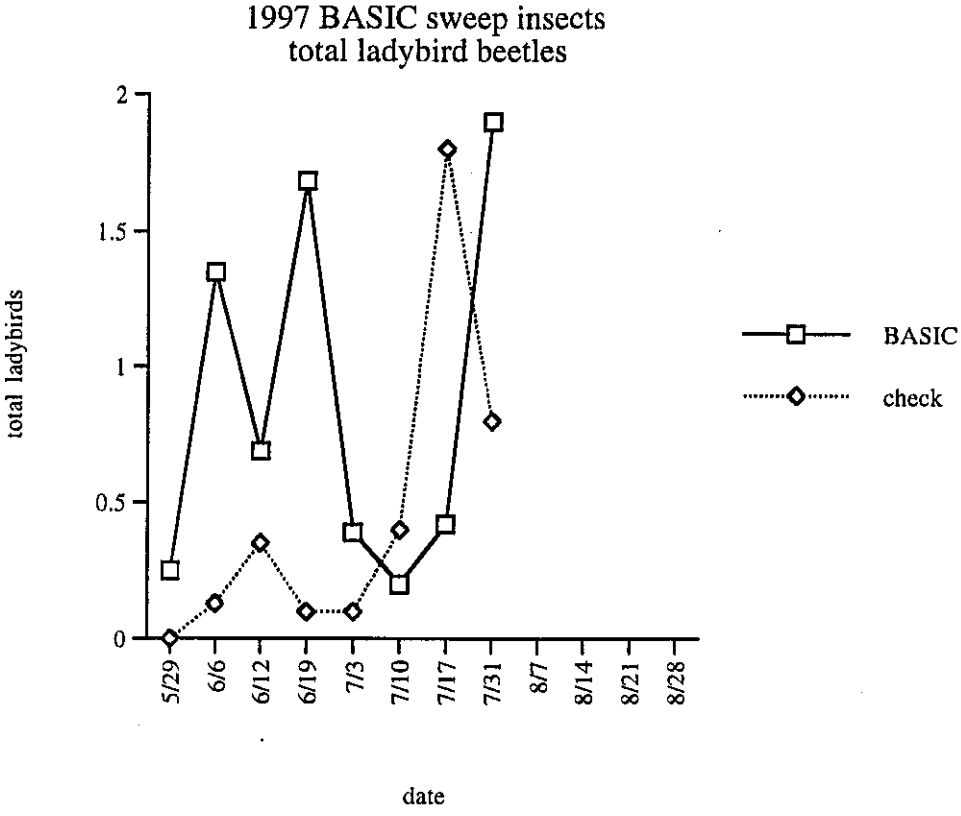

1997 BASIC sweep insects
Total Lygus
total lygus
10
7.5
5
2.5
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

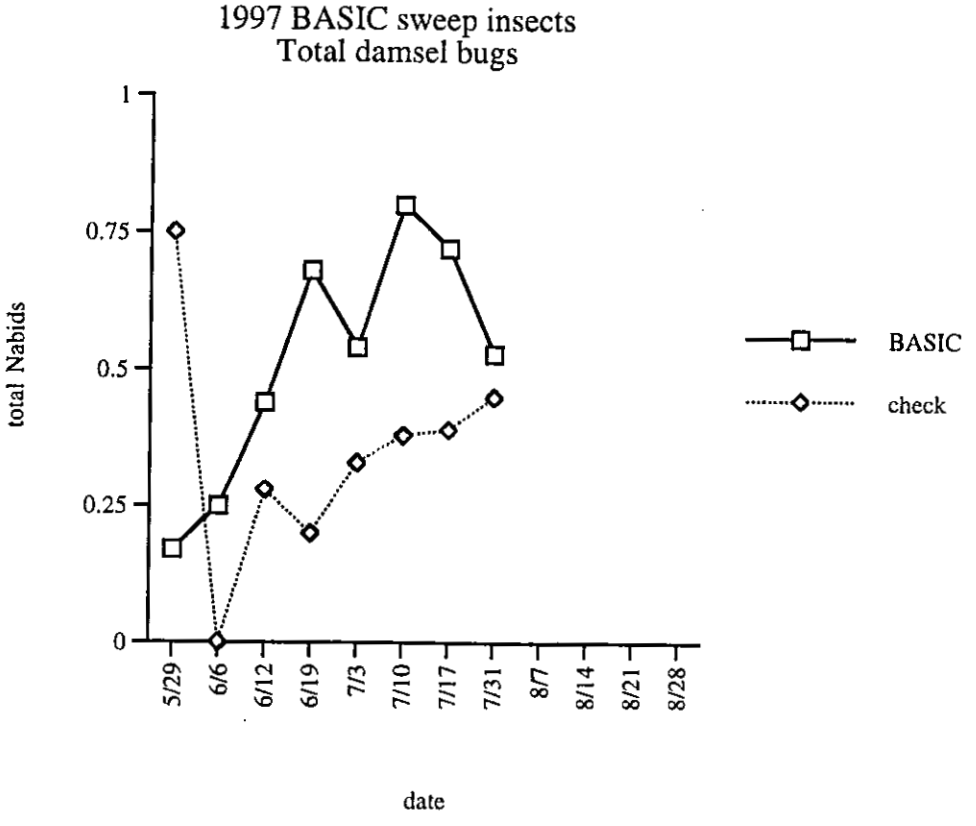

1997 BASIC sweep insects
Lygus nymphs
nymphs per 50 sweeps
0
1
2
3
4
5
6
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

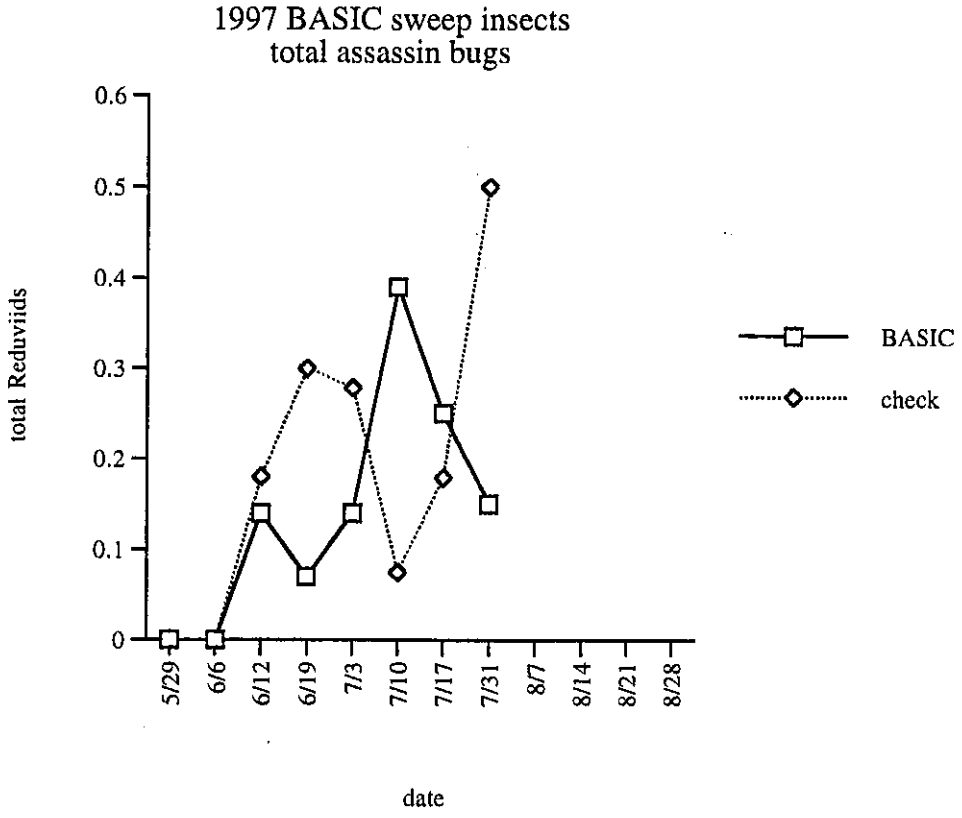

1997 BASIC sweep insects
Total bigeyed bugs
total Geocoris
0
1
2
3
4
5
6
7
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

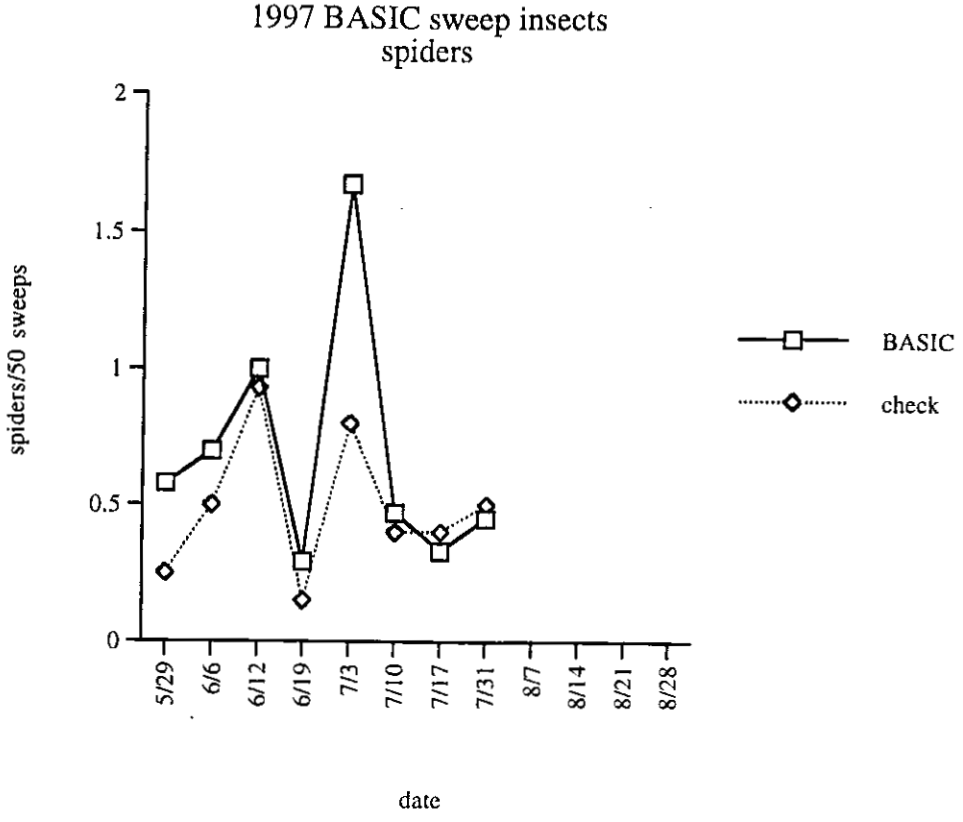

1997 BASIC sweep insects
total minute pirate bugs
total *Orius*
15
10
5
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

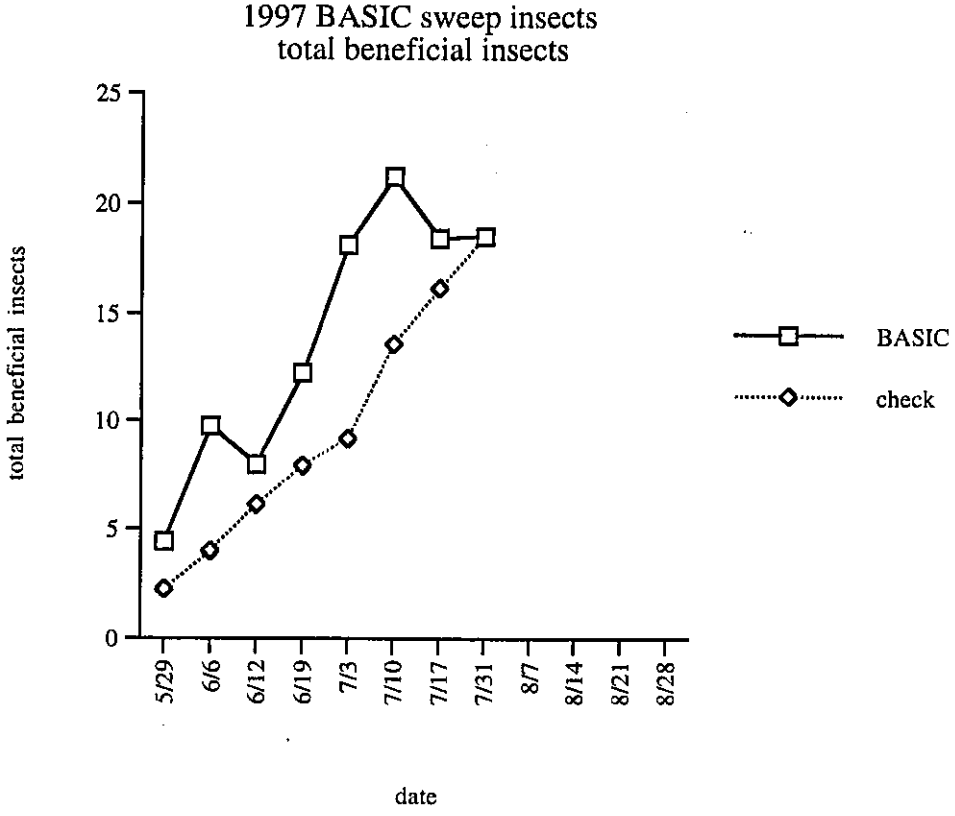

1997 BASIC sweep insects
total lacewings
1.5
1
0.5
0
total lacewings
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

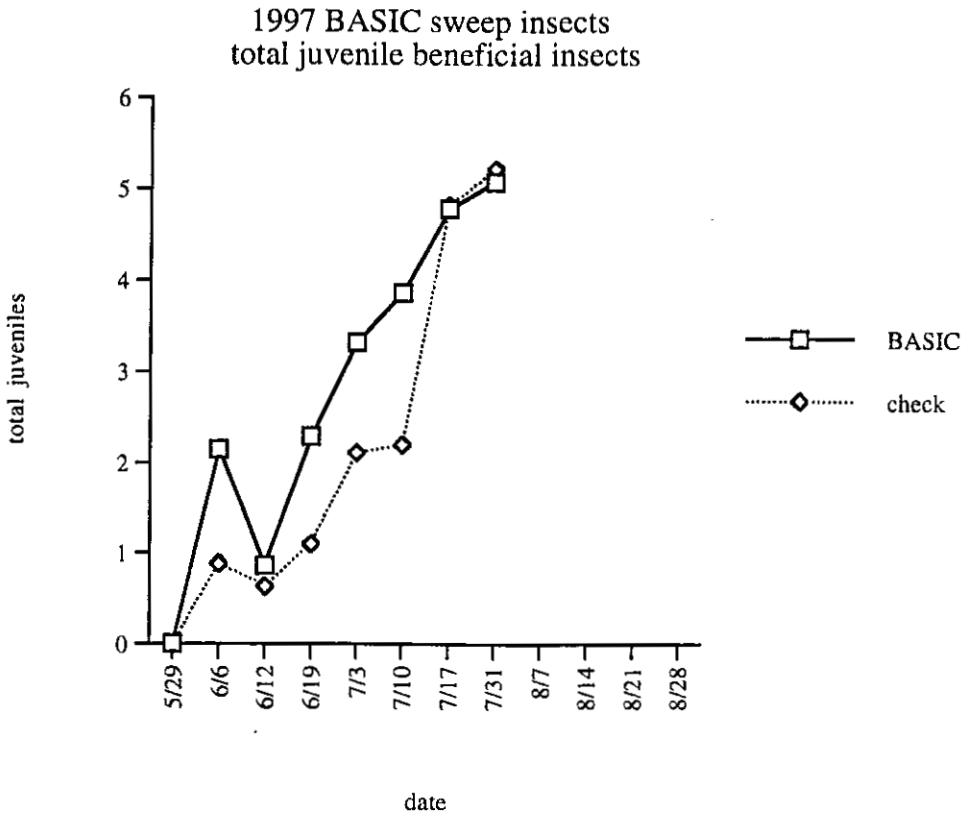

1997 BASIC sweep insects
total ladybird beetles
total ladybirds
2
1.5
1
0.5
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check


1997 BASIC sweep insects
Total damsel bugs
total Nabids
1
0.75
0.5
0.25
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check


1997 BASIC sweep insects
total assassin bugs
total Reduviids
0.6
0.5
0.4
0.3
0.2
0.1
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

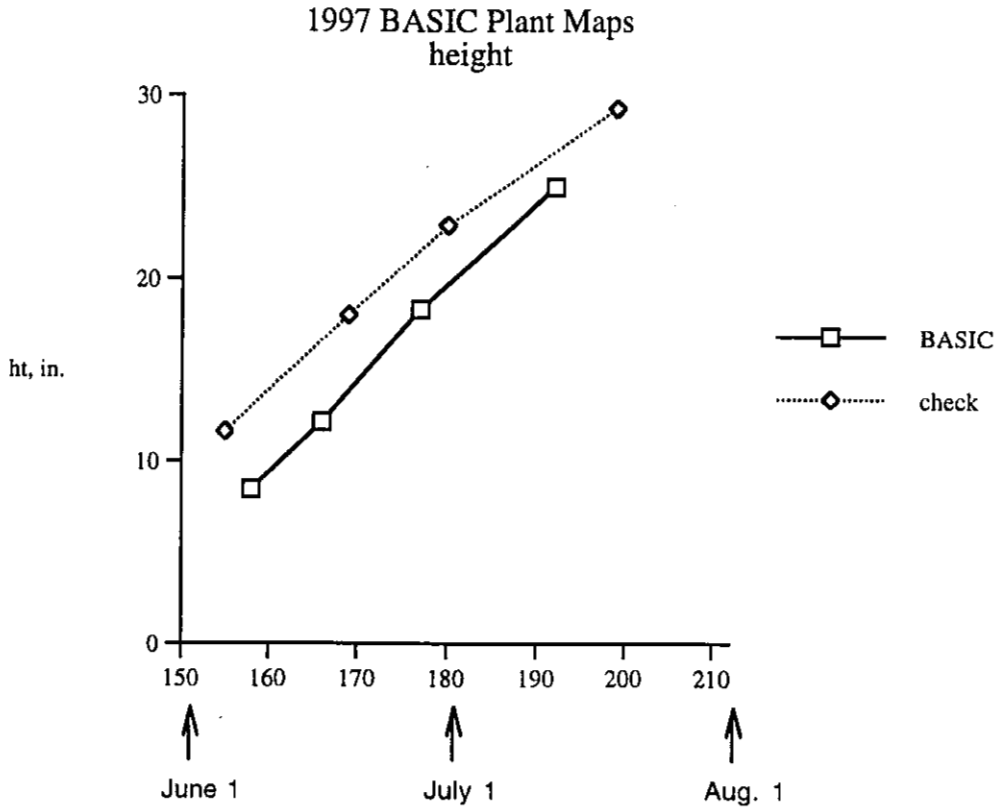

1997 BASIC sweep insects
spiders
spiders/50 sweeps
2
1.5
1
0.5
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

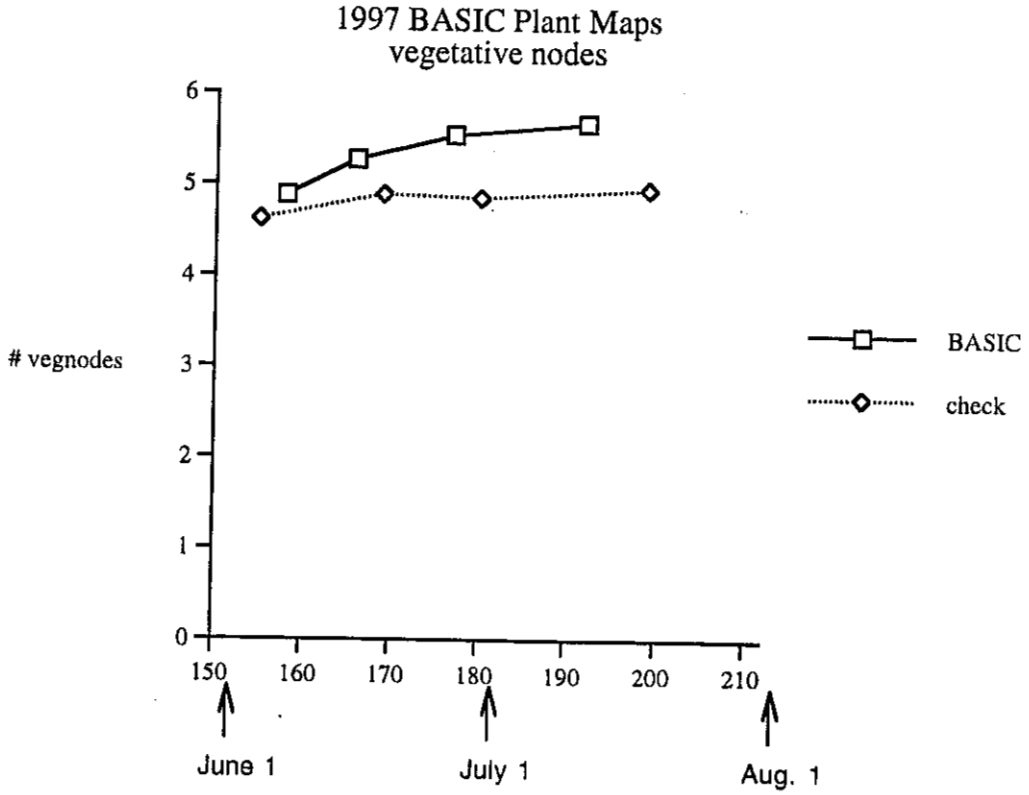

1997 BASIC sweep insects
total beneficial insects
total beneficial insects
25
20
15
10
5
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

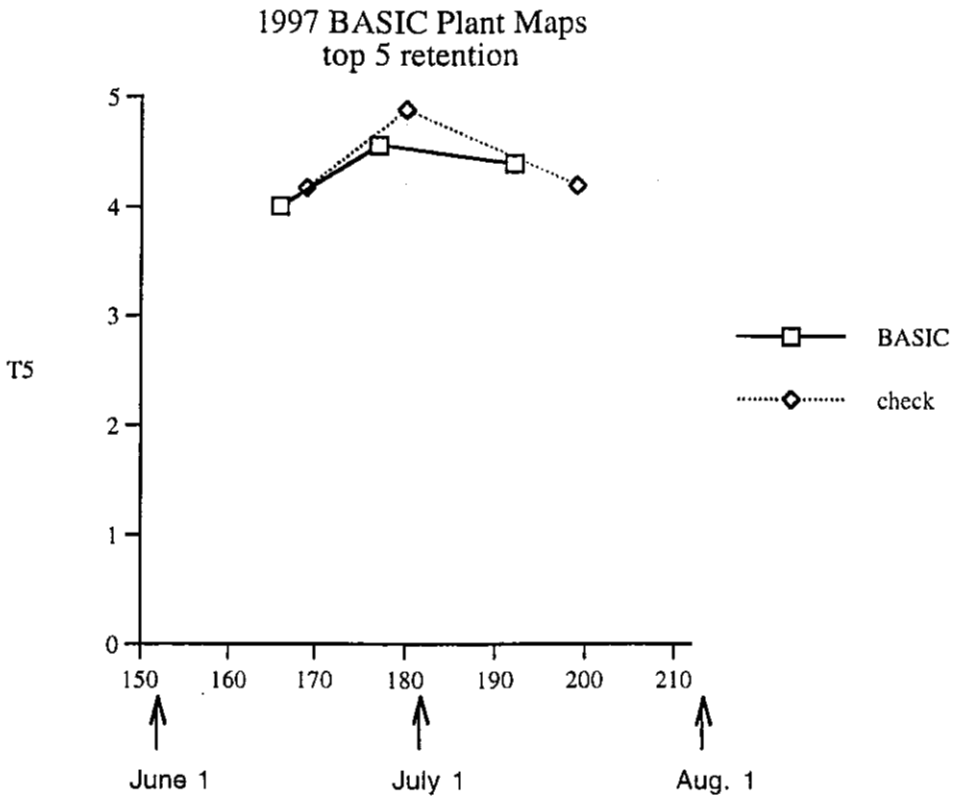

1997 BASIC sweep insects
total juvenile beneficial insects
total juveniles
0
1
2
3
4
5
6
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

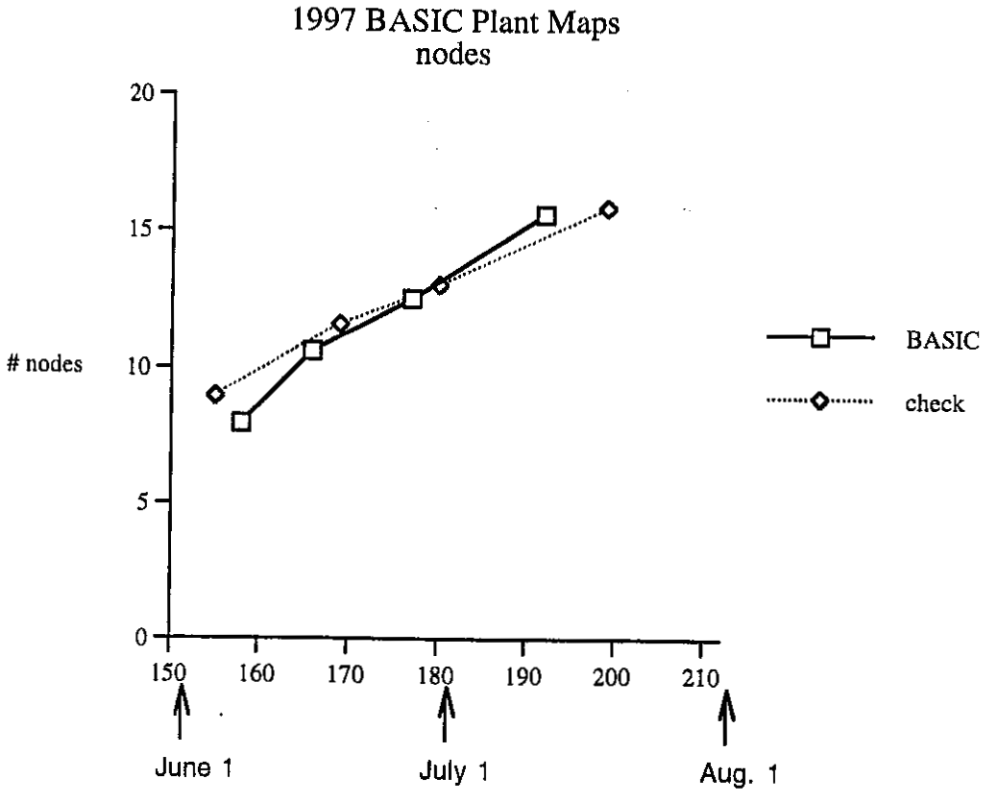
date	trtmt	rep	height	nodes	vegetative nodes	fruiting branches	nodes above white flower	top 5 retent.	bottom 5 retent.
6/2	B	1	11.6	10.5	5.4	5.1			2.9
6/2	B	2	4.1	6.0	4.8	1.4			1.3
6/3	B	3	2.9	5.4	6.0	1.3			1.3
6/3	B	4	4.8	6.7	4.5	2.3			1.3
6/11	B	5	16.7	10.1	4.0	6.1			2.8
6/4	B	6	6.5	7.0	4.6	1.9			
6/4	B	7	4.6	5.8	3.6	0.8			
6/11	B	8	18.6	11.2	3.9	7.0			2.4
6/4	B	9	10.2	9.5	4.2	5.3			3.9
6/3	B	10	4.5	6.1	5.8	1.0			
6/3	B	11	5.0	6.6	6.1	1.2			
6/6	B	12	11.8	10.8	5.7	5.1			3.7
6/12	C	1	15.7	10.5	4.4	6.3			3.7
6/12	C	2	13.8	9.8	4.3	5.6			1.9
6/12	C	3	12.8	8.6	5.0	3.7			4.0
6/4	C	4	6.5	7.3	4.2	2.8			
6/4	C	5	11.2	9.2	4.4	4.8			3.6
6/12	C	6	15.7	11.0	4.3	6.8			3.1
6/4	C	7	12.4	9.7	5.0	4.7			3.1
6/12	C	8	15.0	9.9	4.3	5.8			3.1
6/4	C	9	10.5	8.9	4.5	4.3			3.9
6/11	C	10	5.7	6.1	5.2	1.3			
6/11	C	11	8.7	7.6	5.6	1.9			
6/12	B	1	16.0	13.3	5.7	6.1			4.1
6/13	B	2	7.7	8.4	6.1	2.3			5.0
6/13	B	3	6.5	8.2	6.2	3.2			
6/13	B	4	6.2	7.4	5.0	2.4			5.0
6/17	B	5	18.2	11.1	4.2	7.0	6.0		2.6
6/17	B	6	10.7	9.3	5.2	4.1			4.4
6/17	B	7	11.5	10.5	6.1	2.9			1.0
6/17	B	8	19.8	13.8	3.8	8.4		3.0	2.2
6/18	B	9	17.6	13.3	4.4	7.4		5.0	4.5
6/13	B	10	8.2	8.4	5.8	2.4			
6/19	B	11	10.4	10.2	6.1	4.1			4.3
6/13	B	12	13.2	13.2	5.0	6.6	7.4	4.0	4.0
6/18	C	1	20.1	11.8	4.2	7.4	8.5	5.0	3.7
6/18	C	2	16.6	15.9	4.6	6.5	5.0		3.1
6/19	C	3	15.1	9.9	5.1	4.9			4.1
6/18	C	4	14.7	10.8	4.9	5.9	7.0		3.9
6/19	C	5	18.3	13.6	4.7	7.4	7.0		3.8
6/18	C	6	31.8	12.2	4.8	7.5	7.0		2.9
6/19	C	7	20.8	12.6	5.2	7.4	7.0	3.0	4.2
6/19	C	8	21.7	12.4	4.1	8.3		4.5	2.3
6/18	C	9	18.1	11.5	4.5	7.0			3.4
6/19	C	10	7.1	7.8	6.0	1.9			
6/19	C	11	13.6	9.2	5.9	3.5	1.0		2.5

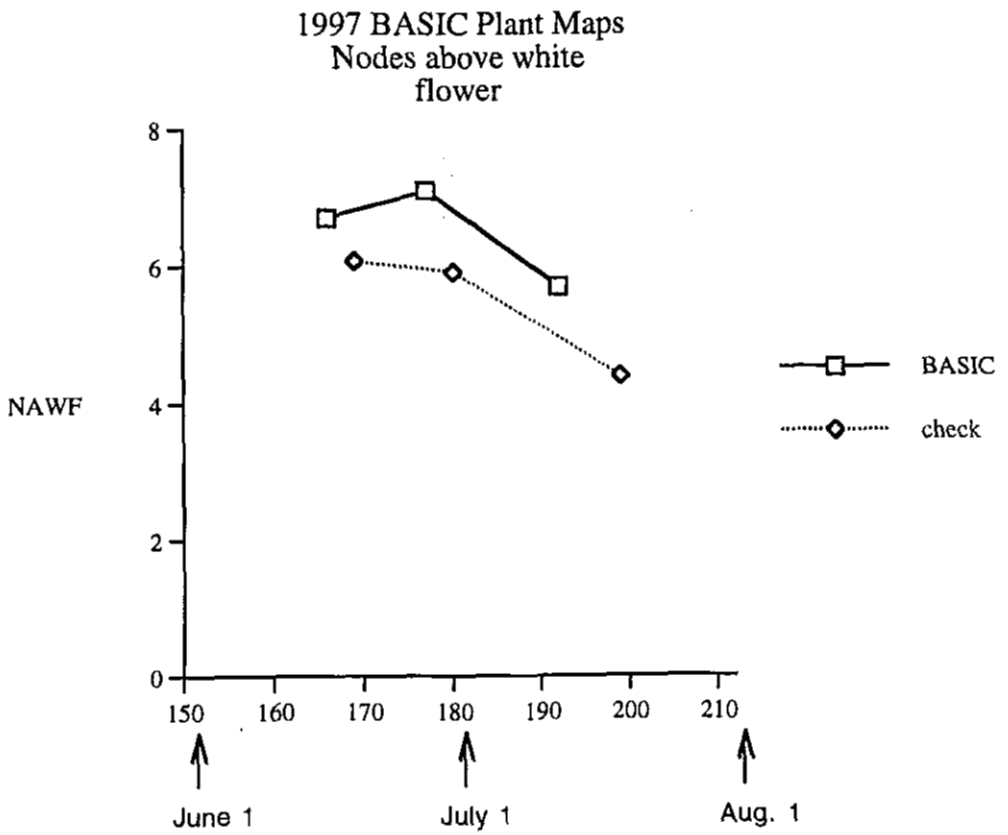
date	trtmt	rep	height	nodes	vegetative nodes	fruiting branches	nodes above white flower	top 5 retent.	bottom 5 retent.
6/20	B	1	21.4	13.5	5.8	7.7			4.0
6/20	B	2	11.4	11.1	6.3	4.7			4.2
6/23	B	3	12.7	11.7	7.5	4.3			
6/25	B	4	14.5	11.9	5.6	6.3			4.7
6/30	B	5	29.8	14.7	3.8	10.9	6.9		1.8
7/2	B	6	16.7	11.8	5.2	6.7			4.1
7/1	B	7	18.5	11.8	5.8	6.0			3.6
6/30	B	8	26.9	13.8	3.9	10.0		4.7	3.3
6/25	B	9	19.5	12.8	5.0	7.5		5.0	4.2
6/25	B	10	15.4	11.7	6.5	4.9			
6/26	B	11	14.5	11.6	6.1	5.5			4.6
6/20	B	12	18.6	13.9	5.4	8.5	7.3	4.0	4.7
7/2	C	1	25.7	14.2	4.0	10.2	6.1	4.9	3.6
7/2	C	2	20.3	12.8	4.1	8.7	5.0		2.6
7/2	C	3	22.9	12.5	5.1	7.4			3.3
7/1	C	4	21.8	12.7	4.8	7.9	6.7		4.4
7/1	C	5	27.6	14.5	4.5	10.0	6.0		3.0
7/2	C	6	25.9	14.5	4.7	9.9	5.2		3.0
7/1	C	7	26.5	14.3	5.4	8.9	6.5	4.8	3.6
7/1	C	8	26.6	13.4	4.4	9.1		4.9	3.2
6/26	C	9	19.3	12.3	4.4	7.9			3.5
7/2	C	10	15.2	10.2	5.6	4.6			
6/30	C	11	20.5	11.8	6.5	5.2			2.6
7/7	B	1	31.7	17.1	5.8	11.4	6.6	4.5	3.1
7/9	B	2	22.8	14.6	6.5	8.2	7.2	4.7	4.4
7/9	B	3	21.4	14.4	7.1	7.3	7.3	5.0	3.9
7/9	B	4	23.2	21.8	5.2	9.5	6.9	4.5	4.7
7/17	B	5	34.7	16.8	3.7	12.9	3.9	3.8	1.7
7/10	B	6	21.8	13.9	6.0	7.9	5.2	4.7	4.0
7/16	B	7	22.3	13.5	6.7	6.8	4.8	5.0	4.1
7/21	B	8	29.4	16.2	4.1	12.1	3.2	2.3	1.7
7/15	B	9	25.4	14.8	4.5	10.3	3.7	3.9	3.7
7/10	B	10	24.7	14.8	7.6	7.2	6.8		3.8
7/9	B	11	21.3	14.2	6.1	8.1	6.6	5.0	4.6
7/2	B	12	22.1	15.3	5.0	10.3	6.4	4.8	4.5
7/15	C	1	30.4	16.0	4.6	11.4	4.5	4.5	3.4
7/15	C	2	25.8	15.1	4.2	10.9	3.9	4.5	2.1
7/16	C	3	33.7	15.3	5.0	10.3	5.6	4.3	3.0
7/22	C	4	29.2	16.3	4.4	12.0	4.0	4.3	4.1
7/21	C	5	33.1	17.1	4.7	12.4	4.5	3.7	2.6
7/15	C	6	31.9	16.9	4.3	12.7	4.8	4.2	1.6
7/22	C	7	27.9	16.3	5.6	10.7	2.0	3.3	2.6
7/21	C	8	32.2	16.6	4.6	12.0	3.2	4.0	2.2
7/16	C	9	25.8	15.3	4.8	10.5	4.1	4.4	3.0
7/16	C	10	23.6	13.8	5.8	8.0	5.9	5.0	4.1
7/16	C	11	28.8	15.6	6.7	8.9	5.8	4.0	3.1

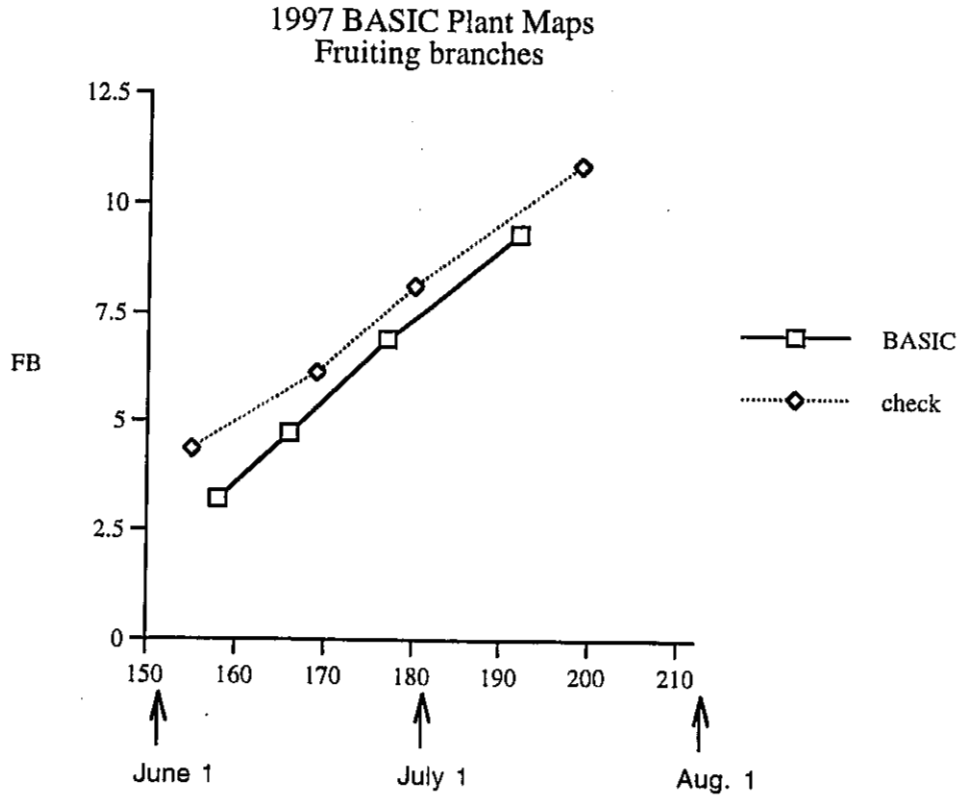

1997 BASIC Plant Maps
height
ht, in.
30
20
10
0
150
160
170
180
190
200
210
June 1
July 1
Aug. 1
BASIC
check

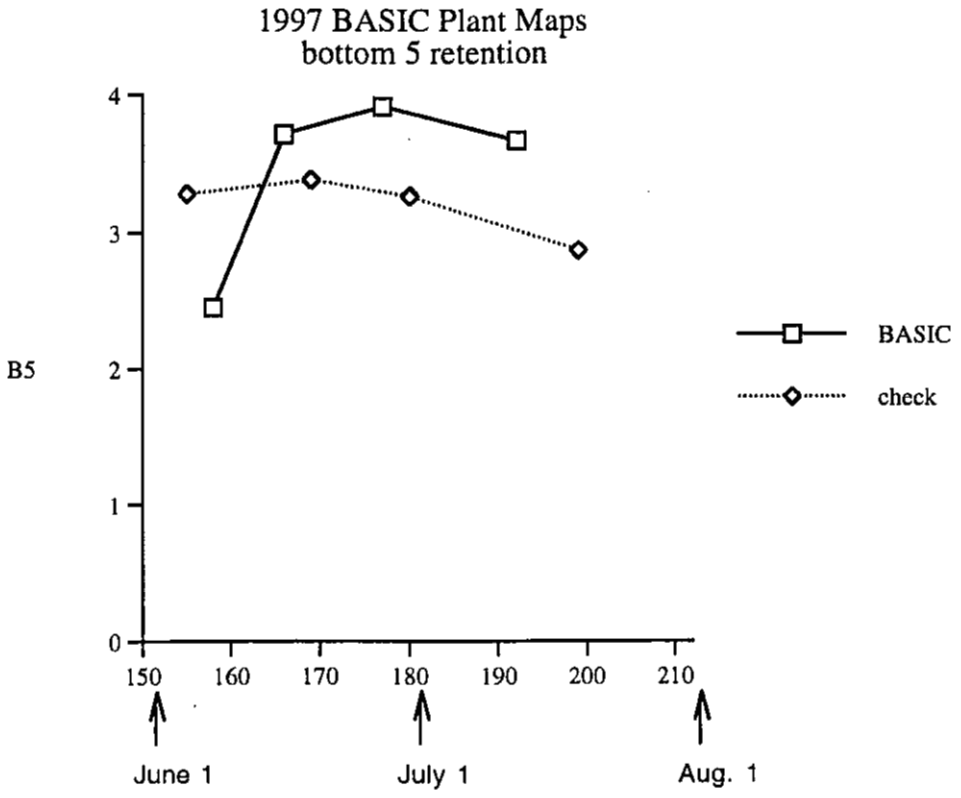

1997 BASIC Plant Maps
vegetative nodes
vegnodes
6
5
4
3
2
1
0
150
160
170
180
190
200
210
June 1
July 1
Aug. 1
BASIC
check


1997 BASIC Plant Maps
top 5 retention
T5
5
4
3
2
1
0
150
160
170
180
190
200
210
June 1
July 1
Aug. 1
BASIC
check


1997 BASIC Plant Maps
nodes
nodes
20
15
10
5
0
150
160
170
180
190
200
210
June 1
July 1
Aug. 1
BASIC
check


1997 BASIC Plant Maps
Nodes above white flower
NAWF
8
6
4
2
0
150
160
170
180
190
200
210
June 1
July 1
Aug. 1
BASIC
check

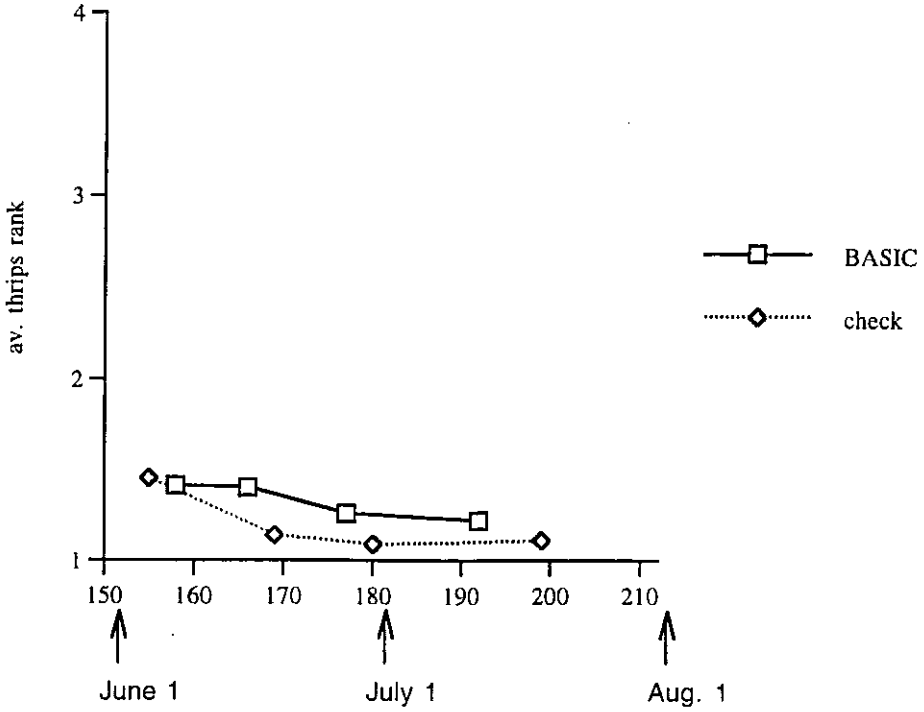

1997 BASIC Plant Maps
Fruiting branches
FB
12.5
10
7.5
5
2.5
0
150
160
170
180
190
200
210
June 1
July 1
Aug. 1
BASIC
check


1997 BASIC Plant Maps
bottom 5 retention
B5
4
3
2
1
0
150
160
170
180
190
200
210
June 1
July 1
Aug. 1
BASIC
check

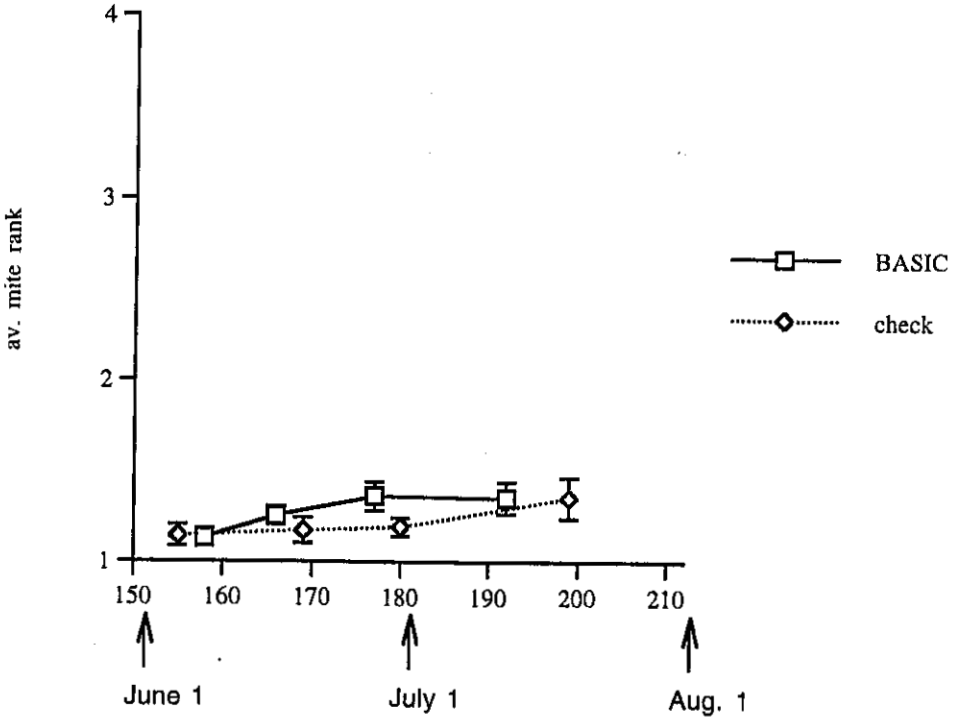
date	trtmt	rep	mite rank	%mite	mite eggs	thrips	aphids	mpb	lw eggs	bigeyed bug eggs	total beneficials
6/2	B	1	1.15	15	1.05	1.45	1.05	0.10	0.00	0.00	0.10
6/2	B	2	1.00	0	1.00	1.60	1.00	0.00	0.05	0.00	0.05
6/3	B	3	1.00	0	1.00	1.40	1.15	0.00	0.00	0.00	0.00
6/3	B	4	1.05	5	1.05	1.20	1.00	0.00	0.00	0.05	0.05
6/11	B	5	1.30	25	1.20	1.25	1.00	0.05	0.00	0.10	0.15
6/4	B	6	1.60	50	1.50	2.05	1.05	0.00	0.00	0.00	0.00
6/4	B	7	1.10	10	1.10	1.65	1.05	0.00	0.05	0.05	0.10
6/11	B	8	1.15	15	1.10	1.30	1.00	0.00	0.05	0.15	0.20
6/4	B	9	1.00	0	1.00	1.30	1.00	0.00	0.00	0.00	0.00
6/3	B	10	1.05	5	1.05	1.35	1.00	0.00	0.00	0.00	0.00
6/3	B	11	1.05	5	1.00	1.15	1.00	0.00	0.00	0.00	0.00
6/6	B	12	1.10	10	1.05	1.20	1.00	0.05	0.00	0.00	0.05
6/12	C	1	1.40	25	1.20	2.00	1.00	0.00	0.00	0.00	0.00
6/12	C	2	1.00	0	1.00	1.00	1.00	0.00	0.00	0.00	0.00
6/12	C	3	1.00	0	1.00	1.20	1.00	0.00	0.05	0.00	0.05
6/4	C	4	1.50	45	1.45	2.35	1.00	0.00	0.00	0.00	0.00
6/4	C	5	1.40	35	1.35	1.65	1.00	0.10	0.05	0.10	0.25
6/12	C	6	1.00	0	1.00	1.25	1.00	0.05	0.00	0.00	0.05
6/4	C	7	1.10	10	1.10	1.50	1.00	0.00	0.10	0.00	0.10
6/12	C	8	1.00	0	1.00	1.15	1.00	0.05	0.05	0.00	0.10
6/4	C	9	1.10	10	1.10	1.55	1.05	0.00	0.00	0.00	0.00
6/11	C	10	1.00	0	1.00	1.10	1.00	0.00	0.00	0.00	0.00
6/11	C	11	1.00	0	1.00	1.25	1.10	0.00	0.00	0.00	0.00
6/12	B	1	1.05	5	1.05	1.20	1.00	0.00	0.00	0.00	0.00
6/13	B	2	1.15	15	1.15	1.50	1.05	0.00	0.00	0.00	0.00
6/13	B	3	1.25	20	1.20	1.65	1.45	0.00	0.00	0.05	0.05
6/13	B	4	1.05	40	1.05	1.10	1.05	0.00	0.00	0.00	0.20
6/17	B	5	1.50	45	1.40	1.60	1.00	0.00	0.05	0.05	0.10
6/17	B	6	1.55	45	1.45	1.80	1.00	0.30	0.00	0.00	0.30
6/17	B	7	1.30	20	1.20	1.35	1.05	0.00	0.00	0.00	0.00
6/17	B	8	1.30	30	1.30	1.25	1.05	0.10	0.15	0.05	0.30
6/18	B	9	1.25	20	1.20	1.15	1.40	0.00	0.05	0.00	0.05
6/13	B	10	1.35	30	1.30	1.30	1.00	0.00	0.05	0.00	0.05
6/13	B	12	1.05	5	1.05	1.45	1.00	0.00	0.00	0.00	0.00
6/18	C	1	1.20	35	1.20	1.20	1.10	0.00	0.00	0.00	0.00
6/18	C	2	1.00	0	1.00	1.00	1.05	0.00	0.10	0.00	0.10
6/18	C	4	1.60	50	1.45	1.30	1.00	0.15	0.20	0.00	0.35
6/19	C	5	1.05	10	1.05	1.05	1.00	0.00	0.00	0.00	0.00
6/18	C	6	1.00	0	1.00	1.35	1.00	0.05	0.00	0.00	0.05
6/19	C	8	1.00	0	1.00	1.05	1.00	0.00	0.05	0.00	0.05
6/18	C	9	1.35	30	1.30	1.00	1.15	0.00	0.00	0.00	0.00

date	trtmt	rep	mite rank	%mite	mite eggs	thrips	aphids	mpb	lw eggs	bigeyed bug eggs	total beneficials
6/20	B	1	1.35	35	1.20	1.50	1.05	0.05	0.20	0.00	0.25
6/20	B	2	1.10	10	1.10	1.45	1.20	0.00	0.10	0.00	0.10
6/23	B	3	1.35	30	1.25	1.25	1.30	0.05	0.05	0.00	0.10
6/25	B	4	1.40	15	1.35	1.30	1.10	0.20	0.00	0.25	0.40
6/30	B	5	1.60	55	1.45	1.35	1.00	0.10	0.00	0.00	0.10
7/2	B	6	1.10	20	1.10	1.10	1.15	0.00	0.10	0.00	0.10
7/1	B	7	1.25	25	1.20	1.15	1.10	0.20	0.10	0.05	0.35
6/30	B	8	1.95	70	1.60	1.05	1.00	0.30	0.05	0.30	0.65
6/25	B	9	1.20	20	1.15	1.35	1.30	0.10	0.15	0.00	0.25
6/25	B	10	1.20	20	1.20	1.25	1.10	0.00	0.20	0.00	0.20
6/26	B	11	1.75	60	1.60	1.20	1.20	0.05	0.15	0.10	0.30
6/20	B	12	1.10	10	1.05	1.15	1.00	0.00	0.05	0.00	0.05
7/2	C	1	1.05	15	1.05	1.00	1.05	0.00	0.10	0.00	0.10
7/2	C	2	1.40	30	1.25	1.00	1.05	0.00	0.05	0.00	0.05
7/2	C	3	1.45	40	1.30	1.20	1.05	0.25	0.10	0.05	0.40
7/1	C	4	1.05	10	1.05	1.05	1.20	0.00	0.05	0.05	0.10
7/1	C	5	1.05	10	1.05	1.10	1.05	0.10	0.05	0.00	0.15
7/2	C	6	1.00	0	1.00	1.15	1.30	0.00	0.05	0.00	0.05
7/1	C	7	1.20	20	1.20	1.10	1.00	0.00	0.00	0.00	0.00
7/1	C	8	1.10	5	1.05	1.10	1.05	0.10	0.00	0.00	0.10
6/26	C	9	1.35	30	1.25	1.05	1.45	0.00	0.10	0.00	0.15
7/2	C	10	1.30	30	1.25	1.05	1.00	0.05	0.00	0.05	0.10
6/30	C	11	1.10	10	1.10	1.15	1.00	0.10	0.00	0.00	0.10
7/7	B	1	1.8	65	1.55	1.55	1.1	0.2	0.25	0.3	0.75
7/9	B	2	1.1	10	1.05	1.15	1.15	0	0.1	0	0.1
7/9	B	3	1.4	35	1.35	1.25	1.5	0	0.2	0	0.2
7/9	B	4	1.45	15	1.35	1.25	1.55	0	0	0.05	0.35
7/17	B	5	1.75	70	1.65	1.25	1.5	0.15	0.1	0.15	0.4
7/10	B	6	1	10	1	1.15	1.3	0	0	0	0
7/16	B	7	1.1	10	1.1	1.05	2.25	0.15	0.1	0.05	0.3
7/21	B	8	1.2	20	1.2	1.2	1.75	0.3	0.05	0	0.35
7/15	B	9	1.15	15	1.1	1.05	1.15	0.2	0.05	0.05	0.3
7/10	B	10	1.05	5	1.05	1	1.2	0.1	0.05	0.05	0.2
7/9	B	11	1.85	65	1.55	1.4	2.3	0.15	0.15	0.05	0.35
7/2	B	12	1.3	25	1.2	1.3	1	0	0.05	0	0.05
7/15	C	1	1.1	20	1.1	1	2	0.1	0.15	0	0.25
7/15	C	2	2.2	90	1.8	1.25	2.05	0	0.15	0.1	0.25
7/16	C	3	1.5	50	1.45	1.1	1.3	0.1	0	0.1	0.2
7/22	C	4	1	5	1	1.15	1.75	0	0.1	0.1	0.2
7/22	C	5	1	5	1	1.05	1.9	0.3	0.1	0	0.4
7/15	C	6	1.05	5	1	1	2.35	0.05	0.05	0.1	0.2
7/22	C	7	1.5	50	1.45	1	1.25	0.25	0	0.2	0.45
7/21	C	8	1.05	5	1.05	1	1.4	0.05	0.05	0	0.1
7/15	C	9	1.8	70	1.7	1.35	1.85	0.1	0.1	0.15	0.35
7/16	C	10	1.35	35	1.35	1.2	1	0.1	0.05	0	0.15
7/16	C	11	1.3	30	1.25	1.15	1.2	0.1	0.05	0	0.15

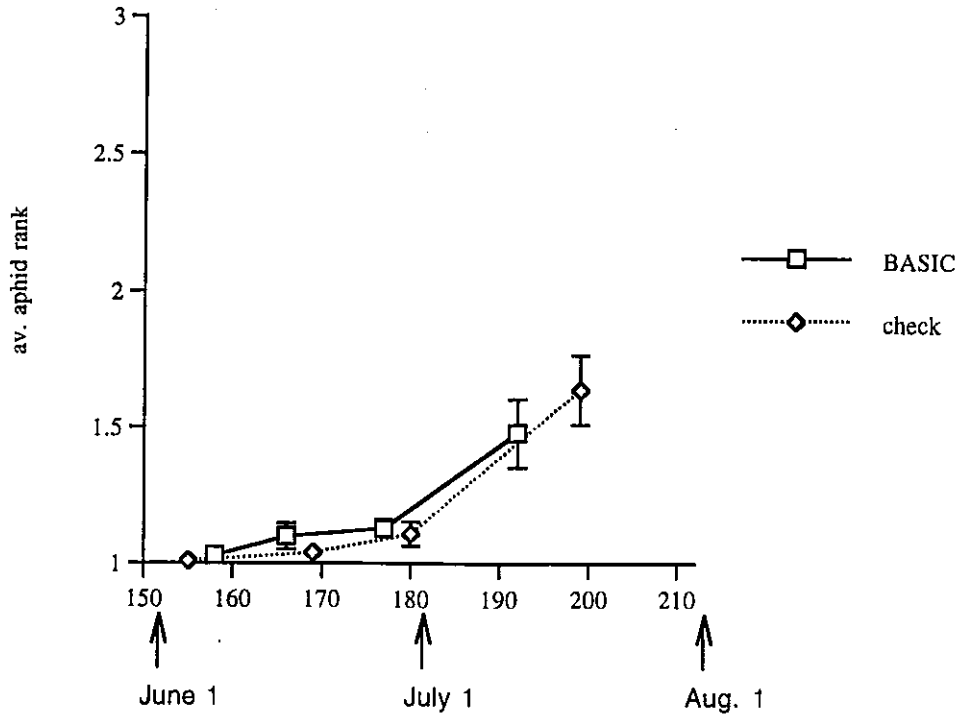
1997 BASIC leaf insects
thrips

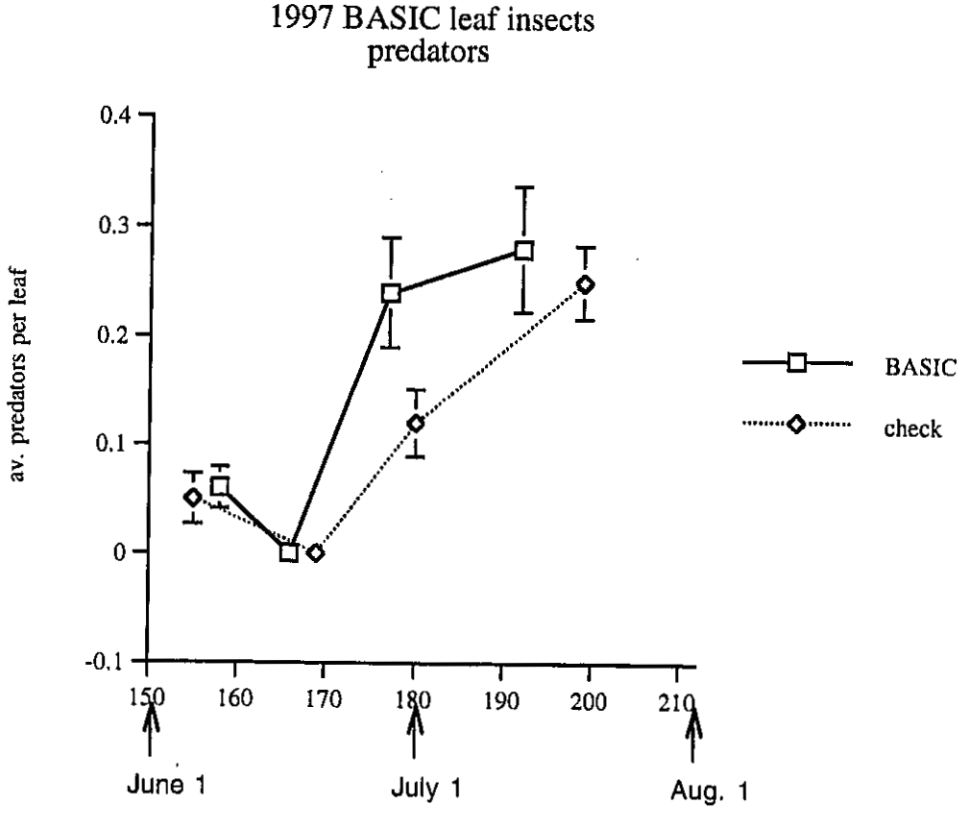


1997 BASIC Leaf Insects
mites



1997 BASIC leaf insects
aphids




1997 BASIC leaf insects
predators
av. predators per leaf
0.4
0.3
0.2
0.1
0
-0.1
150
160
170
180
190
200
210
June 1
July 1
Aug. 1
BASIC
check

UNIVERSITY OF CALIFORNIA, SANTA CRUZ

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CENTER FOR AGROECOLOGY
AND SUSTAINABLE FOOD SYSTEMS

SANTA CRUZ, CALIFORNIA 95064

10 September 1997

Dear cotton growers:

Enclosed is the third set of updates from the BASIC plant mapping and insect sampling efforts, extending to early September. Fields have the same code as in the prior update. This is your code:
Code: trtmt: _____ rep: _____

Tables: Each number on the tables represents an *average*. For the sweep net samples, each number is an average of four 50-sweep samples on each date in each field. For the plant map samples, each number is an average of 20 plants or 20 leaves on each date in each field. Some fields have not been sampled every week. Wet fields, fields that have been sprayed, and sometimes time constraints prevent us from reaching every field each week. These tables are not intended to substitute for pest control information and recommendations made by a licensed pest control advisor.

Graphs: Graphs show a picture of averages for each treatment (BASIC or check), to give you an idea of how the two treatments are performing overall in time. The horizontal axis goes from June 1 to September 5. For the sweep net sample graphs, the vertical axis is the average number of insects per 50 sweeps with a sweep net.

What do the graphs mean? Aphid populations are currently very low, which is a good sign as we head into the harvest season. *Lygus* populations have begun to drop off in the last few weeks. Again, *Lygus* numbers are not particularly crucial at this late period in the season. Beneficial insect numbers (mostly bigeyed bugs and minute pirate bugs) have remained high in both BASIC and check fields. The total number of beneficial insects is greater in BASIC fields than in check fields, and these insects should be helpful in managing any late season aphid populations. Total numbers of juvenile beneficial insects are also higher in BASIC fields, showing that the beneficials are staying around long enough to reproduce in the fields.

BASIC and check fields are similar in height, nodes, and bottom 5 retention, but remain slightly behind check fields in fruiting branch number. Top 5 retentions have declined dramatically as the plants shut down. Total first position bolls per plant are similar in BASIC and check fields, but are slightly lower in the organic BASIC fields. However, *total* bolls per plant is higher in both BASIC and organic BASIC fields than in check fields. What this means in terms of actual yields will depend on the plant density in each field and on individual boll weights, which can vary greatly. Given this uncertainty, our preliminary calculations estimate average yields for both BASIC and check growers of around 3 bales per acre.

If you have any questions about these graphs or charts, please feel free to contact Sean Swezey at (408) 459-4367. Our next Field Day will be on September 23rd; you will receive information about it in the mail.

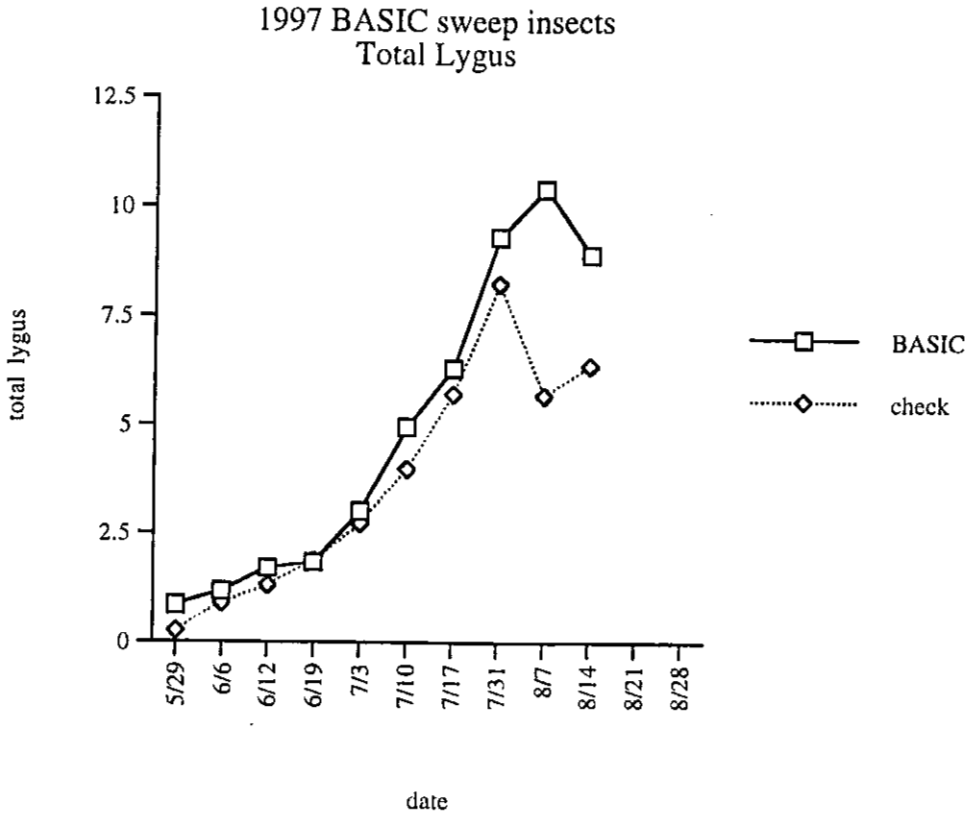
Sincerely,

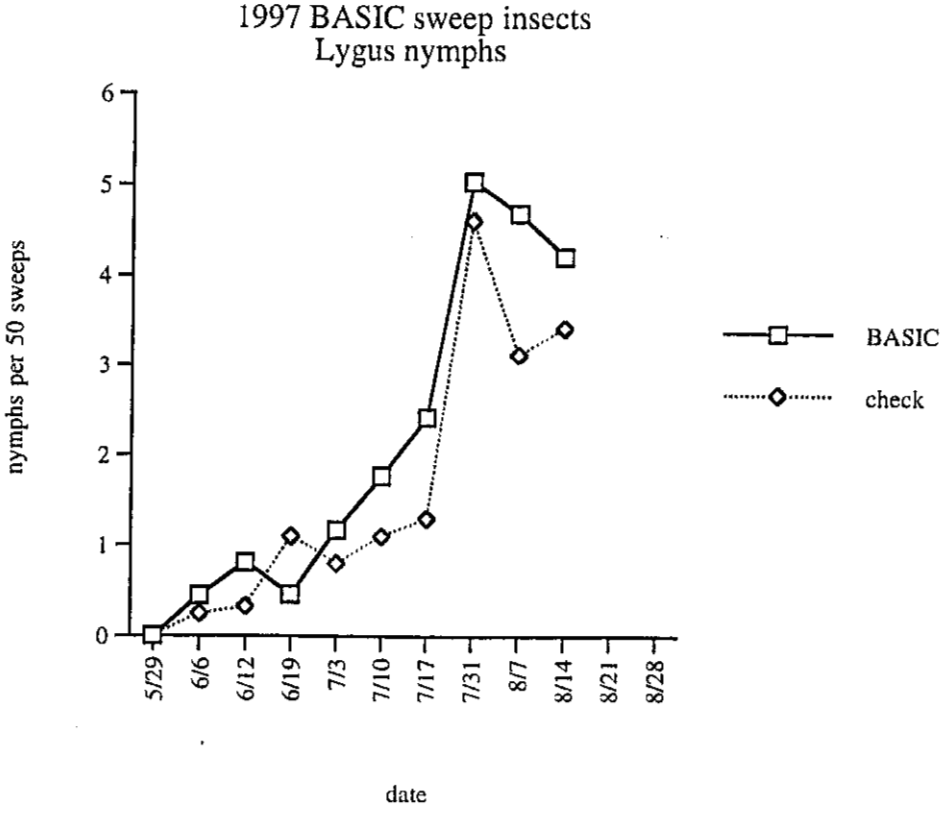
Sean L. Swezey and Polly Goldman
Center for Agroecology and Sustainable Food Systems
University of California
Santa Cruz, CA 95064
(408) 459-4367

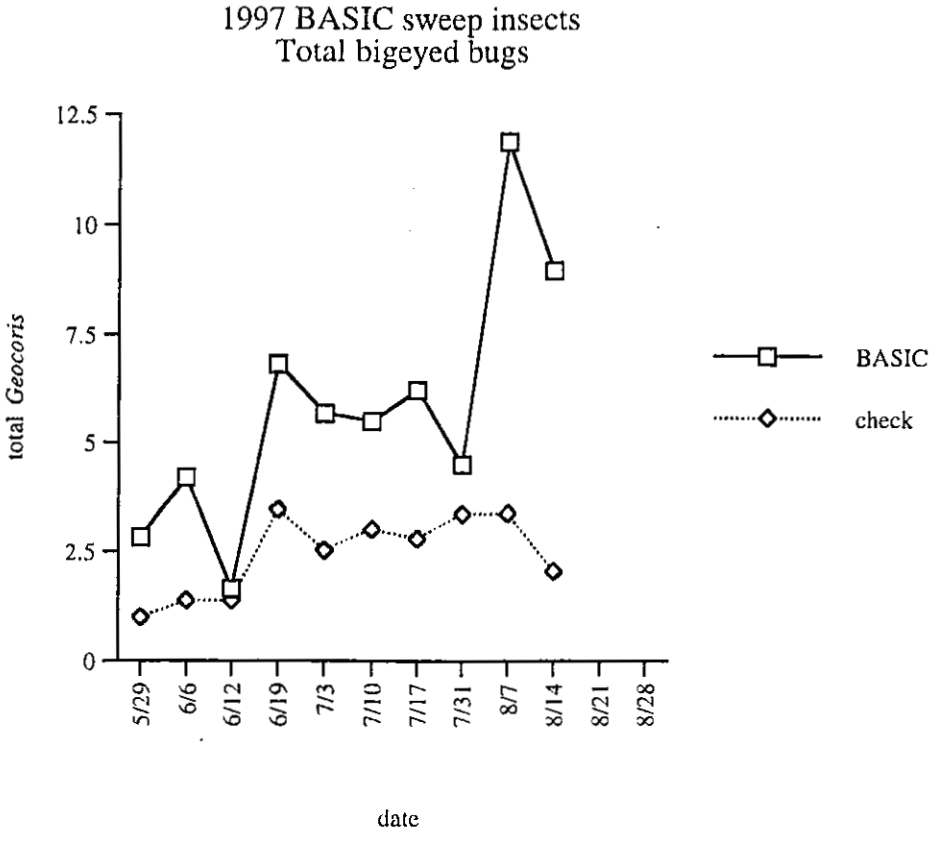
date	trtmt	rep	height	nodes	vegetative nodes	fruiting branches	nodes above white flower	top 5 retent.	bottom 5 retent.
7/7	B	1	31.7	17.1	5.8	11.4	6.6	4.5	3.1
7/9	B	2	22.8	14.6	6.5	8.2	7.2	4.7	4.4
7/9	B	3	21.4	14.4	7.1	7.3	7.3	5.0	3.9
7/9	B	4	23.2	21.8	5.2	9.5	6.9	4.5	4.7
7/17	B	5	34.7	16.8	3.7	12.9	3.9	3.8	1.7
7/10	B	6	21.8	13.9	6.0	7.9	5.2	4.7	4.0
7/16	B	7	22.3	13.5	6.7	6.8	4.8	5.0	4.1
7/21	B	8	29.4	16.2	4.1	12.1	3.2	2.3	1.7
7/15	B	9	25.4	14.8	4.5	10.3	3.7	3.9	3.7
7/10	B	10	24.7	14.8	7.6	7.2	6.8	N/D	3.8
7/9	B	11	21.3	14.2	6.1	8.1	6.6	5.0	4.6
7/2	B	12	22.1	15.3	5.0	10.3	6.4	4.8	4.5
7/15	C	1	30.4	16.0	4.6	11.4	4.5	4.5	3.4
7/15	C	2	25.8	15.1	4.2	10.9	3.9	4.5	2.1
7/16	C	3	33.7	15.3	5.0	10.3	5.6	4.3	3.0
7/22	C	4	29.2	16.3	4.4	12.0	4.0	4.3	4.1
7/21	C	5	33.1	17.1	4.7	12.4	4.5	3.7	2.6
7/15	C	6	31.9	16.9	4.3	12.7	4.8	4.2	1.6
7/22	C	7	27.9	16.3	5.6	10.7	2.0	3.3	2.6
7/21	C	8	32.2	16.6	4.6	12.0	3.2	4.0	2.2
7/16	C	9	25.8	15.3	4.8	10.5	4.1	4.4	3.0
7/16	C	10	23.6	13.8	5.8	8.0	5.9	5.0	4.1
7/16	C	11	28.8	15.6	6.7	8.9	5.8	4.0	3.1

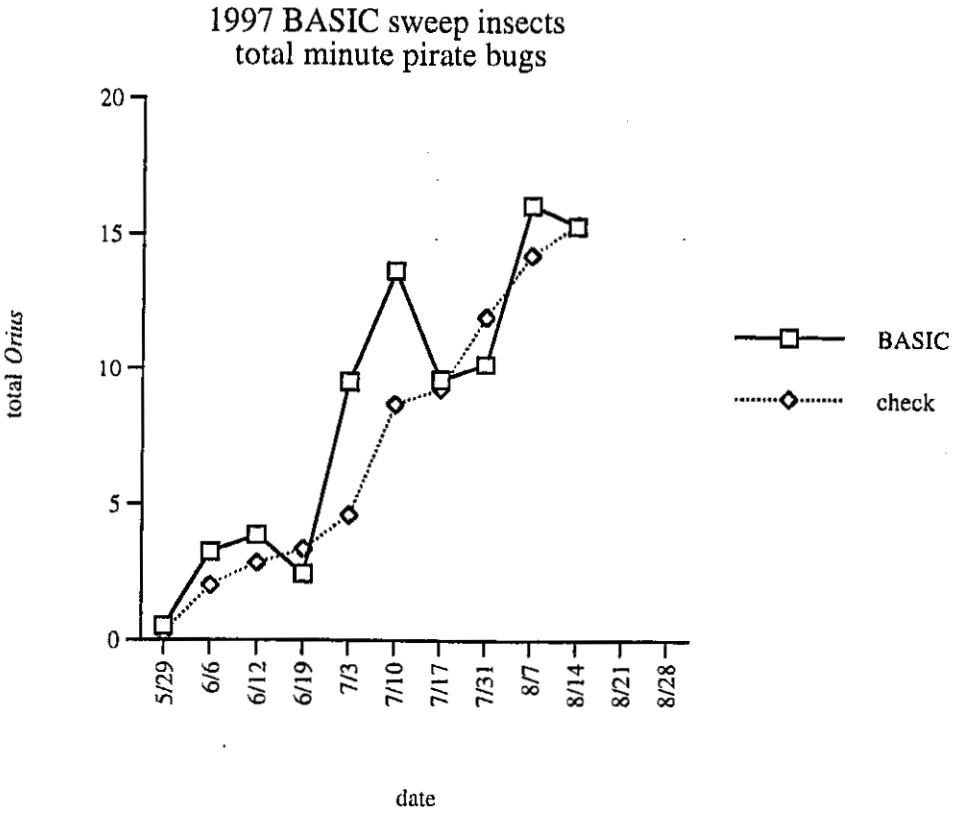
date	trtmt	rep	height	nodes	vegetative nodes	fruiting branches	top 5 retent.	bottom 5 retent.	First position bolls	Total bolls per plant	Total bolls per 1/1000 acre
8/26	B	1	40.5	17.1	5.8	11.9	0.6	3.0	5.1	15.4	466
8/26	B	2	37.6	21.7	6.4	15.3	0.9	4.0	6.5	14.0	388
8/26	B	3	34.3	19.7	7.3	12.5	0.8	3.4	4.6	8.3	356
8/26	B	4	34.0	13.6	5.4	8.2	0.9	3.6	5.3	14.9	587
8/21	B	5	39.9	17.8	3.8	14.1	0.9	1.6	3.8	7.8	341
8/26	B	6	29.0	13.1	5.6	7.5	0.9	3.0	7.4	12.8	718
8/26	B	7	34.9	13.2	6.2	7.0	1.1	3.3	5.0	15.3	853
8/21	B	8	42.6	20.1	4.0	16.2	1.3	1.7	3.6	7.4	371
8/21	B	9	36.3	21.9	5.5	16.5	1.1	3.5	5.3	10.1	421
8/26	B	10	37.1	19.6	7.0	12.6	1.5	2.9	4.8	15.7	592
8/26	B	11	31.5	13.1	6.1	7.1	0.4	3.5	4.7	13.9	493
8/26	B	12	32.3	14.7	5.2	9.5	0.8	4.2	5.7	16.3	506
8/21	C	1	34.8	17.4	4.3	13.2	1.2	2.4	4.7	7.9	455
8/21	C	2	31.8	18.8	4.2	14.6	0.5	2.2	4.4	6.1	336
9/4	C	3	44.6	19.7	5.1	14.6	0.9	2.6	5.0	7.1	385
8/21	C	4	33.4	16.8	4.8	12.0	1.2	3.6	6.3	11.1	631
8/21	C	5	34.7	17.4	4.6	12.8	1.3	3.1	5.3	7.1	417
8/21	C	6	40.3	19.4	4.5	14.9	1.0	2.8	5.3	7.9	413
8/21	C	8	32.5	16.4	4.5	11.9	1.1	1.7	4.2	6.4	437
8/21	C	9	29.1	17.5	4.5	13.0	0.6	3.1	5.2	7.2	372
9/4	C	10	36.8	20.2	5.7	14.5	0.4	2.2	3.5	6.2	416
8/26	C	11	40.3	15.1	6.6	8.5	2.1	2.3	4.5	15.0	903

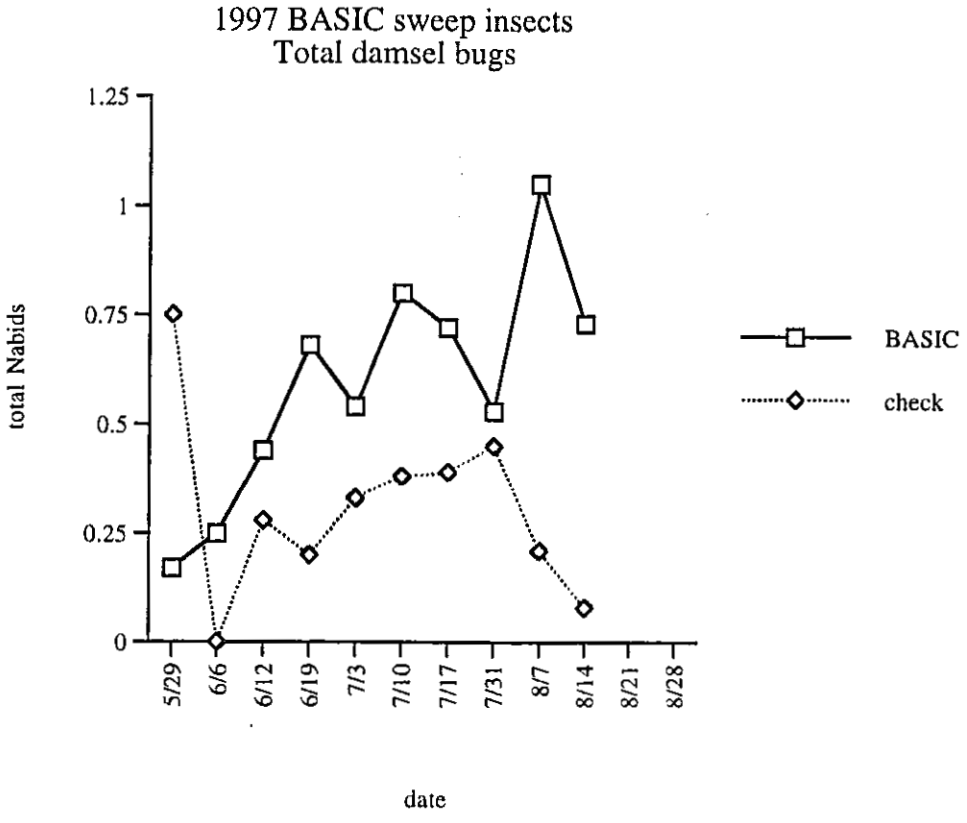
date	trtmt	rep	lygus	bigeyed bugs	minute pirate bugs	damsel bugs	assassin bugs	ladybird beetles	lacewing	spiders	All juveniles	All beneficials
8/9	B	1	8.5	16.25	15.5	0.5	0.5	1	0.75	1.25	11.25	35.75
8/9	B	2	11	15.25	28.75	1	0.5	5.75	1.75	1.75	13	54.75
8/9	B	3	11	6.5	19.5	0.25	0.25	9.5	1.25	0	16.75	37.25
8/9	B	4	12	13.25	14.75	0.25	1	10.5	0.5	1.25	8.25	41.5
8/8	B	6	5.25	16	7	2.25	0.5	0	0	1	8.25	26.75
8/8	B	8	12	14.75	22.25	3	1.25	0.25	0.75	2	14.25	44.25
8/8	B	9	12.5	4.25	14.75	0.75	1.75	0	1.5	2	2.75	25
8/9	B	10	8.25	9.75	13.5	1	0.5	0	1.25	1	10	27
8/9	B	11	17.5	14.5	18.75	0.5	0.25	3.25	1.25	1.25	17.25	39.75
8/8	B	12	6	8.25	5.5	1	0.25	0	1	2.25	4.5	18.25
8/8	C	1	4.25	5.25	15.5	0	3.25	0.5	1	1	8.75	26.5
8/9	C	3	3.75	0.5	15.25	0	0.25	1.5	0.5	0	2	18
8/9	C	5	3	2.5	21.25	0	1	0.25	0.5	1	9.25	26.5
8/9	C	6	6.25	2	8	0	0.75	0	0.25	1	1.25	11.5
8/9	C	7	3.5	3.75	14	0.75	1	0	0.25	1	6.75	20.75
8/9	C	9	8.75	4.5	13.25	0.25	1.25	0.5	1.5	0.5	3.5	21.75
8/9	C	10	10.25	5	12	0.5	0.25	0.75	1	0	5	19.5
8/15	B	1	10.75	4.25	20.75	0.75	1.5	0	0.75	1	7.75	29
8/15	B	2	15.5	6.75	28.5	1	1.25	3.25	2.25	1.5	14	45.75
8/15	B	3	14.75	10	23	1.5	1	4.25	3	2	12	46
8/15	B	4	14	11	19.25	0	0.75	12.5	2	0.5	22.5	32.5
8/16	B	5	2.75	8.5	6.75	0.5	0.75	0	0.5	1.75	5	18.75
8/16	B	6	8.25	13.75	9.75	1.5	1.5	0.5	1	1	5.75	29
8/16	B	7	6.5	3.5	14.5	0	0.25	0	0	0.5	3	18.75
8/16	B	9	3.25	4.25	8.25	0	0.75	0.5	0.5	0.75	3.25	15
8/15	B	10	9.75	5.5	17.75	2	1.25	0	0.25	0	6.25	26.75
8/15	B	11	3.5	22.25	4.25	0	0.5	1.25	0.5	0.75	13.75	29.5
8/16	C	1	2.5	0	9.5	0	2.5	0	0.5	1	1	13.5
8/16	C	2	10.5	7	17.75	0	1.5	0.25	0.75	0	10.5	28
8/15	C	3	15	1.75	44.5	0	2.5	0.75	2.25	1	12.5	54.25
8/16	C	5	1	0.33	4	0	1.33	0.67	0.33	0.67	1.33	7.33
8/16	C	6	6.5	0.75	19.25	0	0.5	0.25	0.5	0.75	5.25	22.25
8/16	C	7	1.5	0.25	7	0	1.25	0	0.5	0	2.5	9
8/16	C	8	2	1	10.5	0	0.5	0	0.5	0.5	4.5	13
8/16	C	9	5.5	5.25	8.5	0	0.75	1.75	1.25	0.5	3	18.25
8/15	C	10	12.75	2	17	0.75	0.75	0	0.5	0.25	5.25	21.75

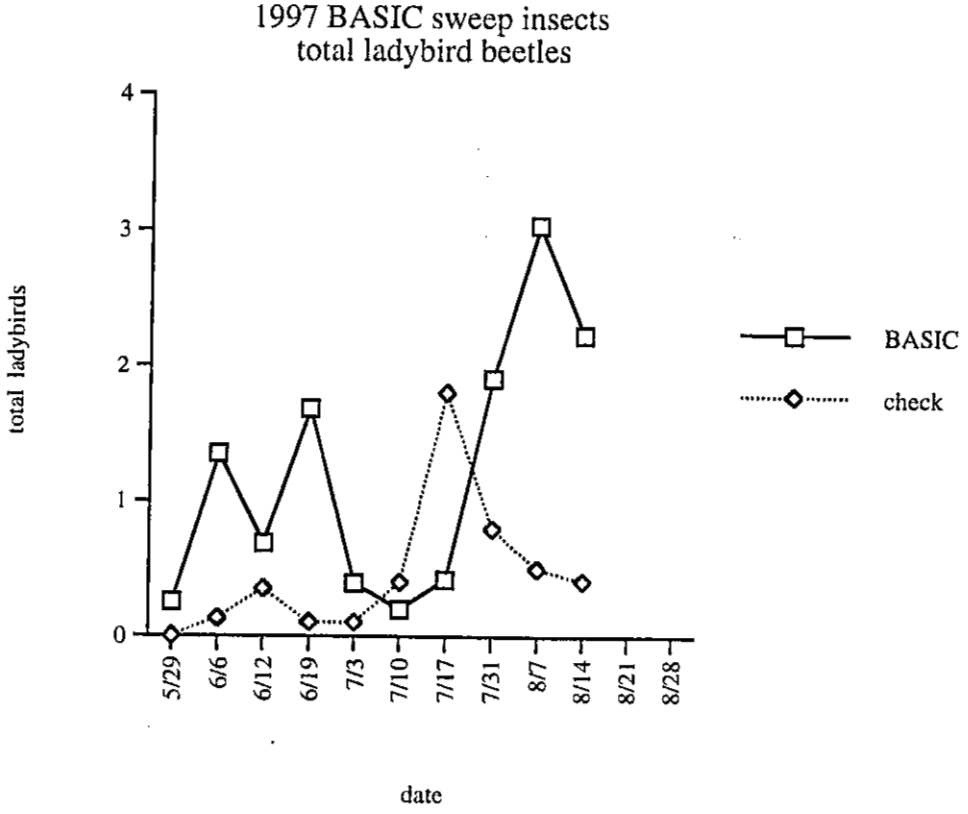

1997 BASIC sweep insects
Total Lygus
12.5
10
7.5
5
2.5
0
total lygus
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

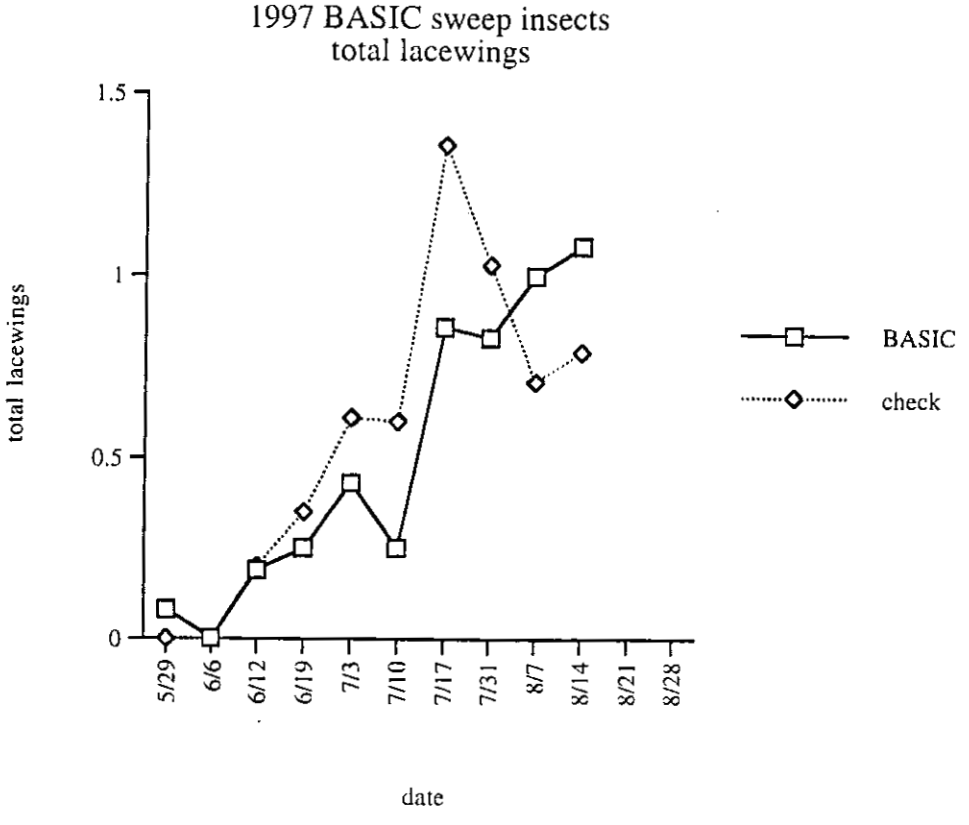

1997 BASIC sweep insects
Lygus nymphs
nymphs per 50 sweeps
0
1
2
3
4
5
6
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

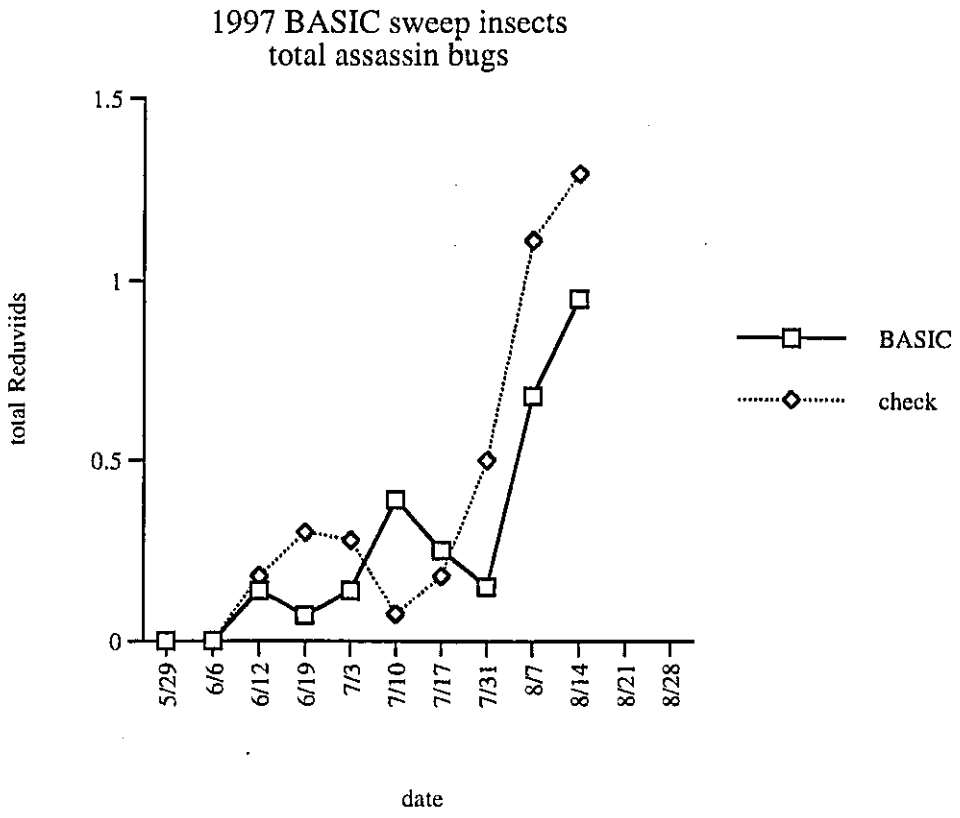

1997 BASIC sweep insects
Total bigeyed bugs
total Geocoris
12.5
10
7.5
5
2.5
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

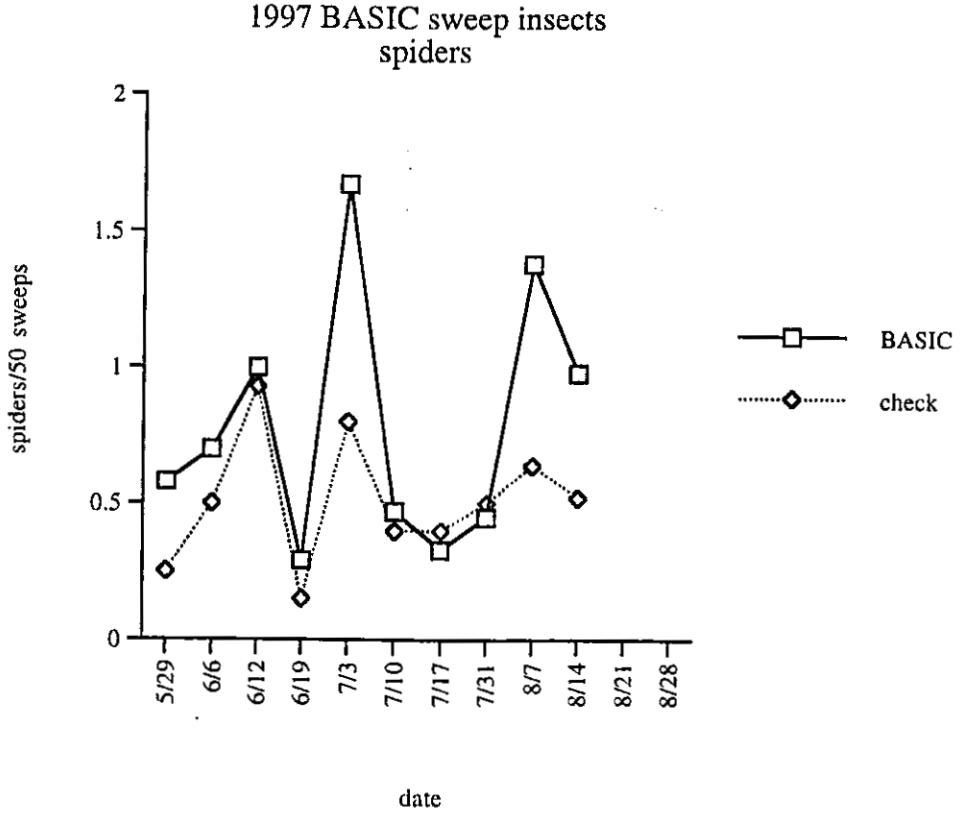

1997 BASIC sweep insects
total minute pirate bugs
total *Orius*
20
15
10
5
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

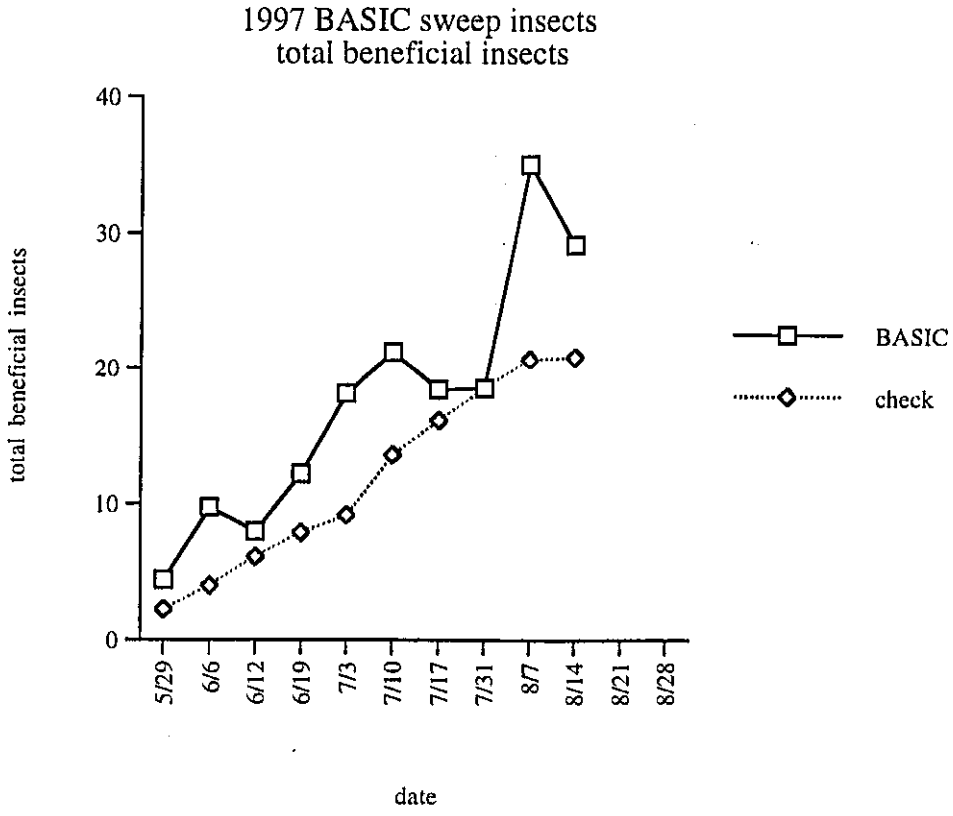

1997 BASIC sweep insects
Total damsel bugs
total Nabids
1.25
1
0.75
0.5
0.25
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

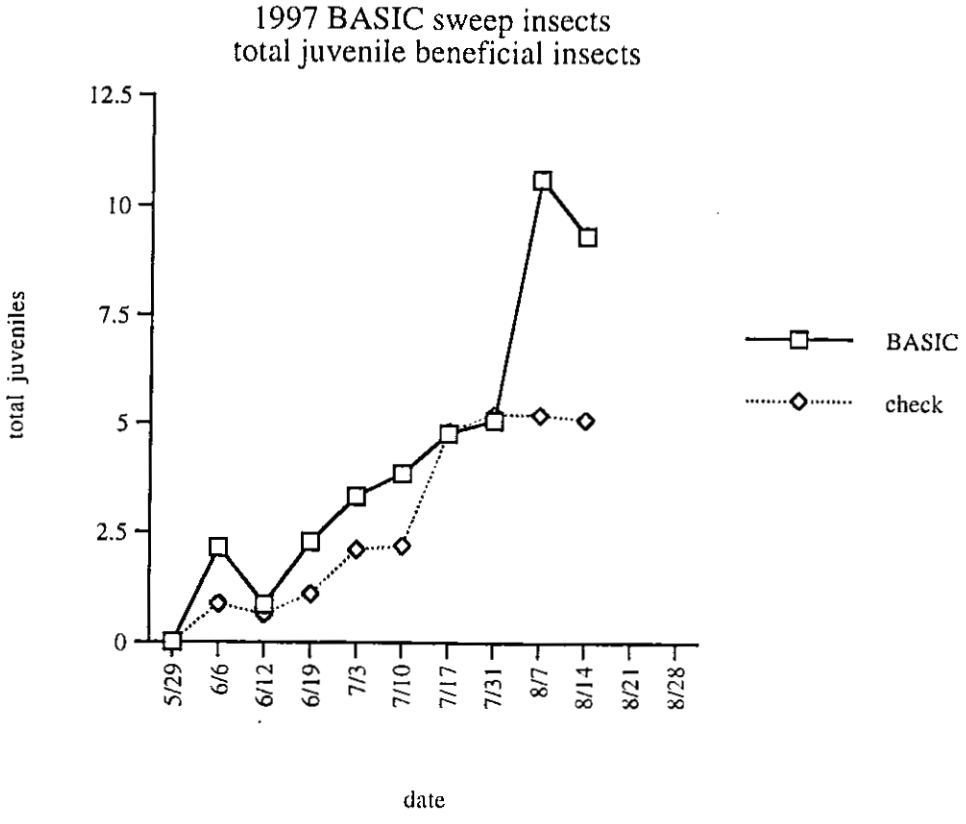

1997 BASIC sweep insects
total ladybird beetles
total ladybirds
4
3
2
1
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

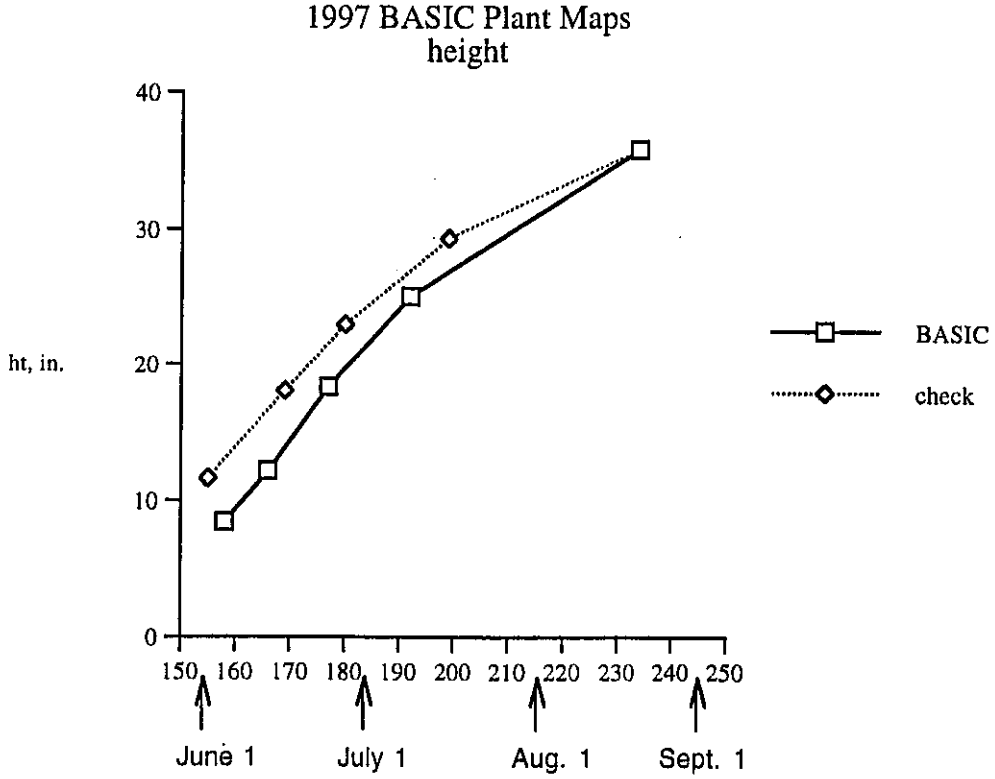

1997 BASIC sweep insects
total lacewings
total lacewings
1.5
1
0.5
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

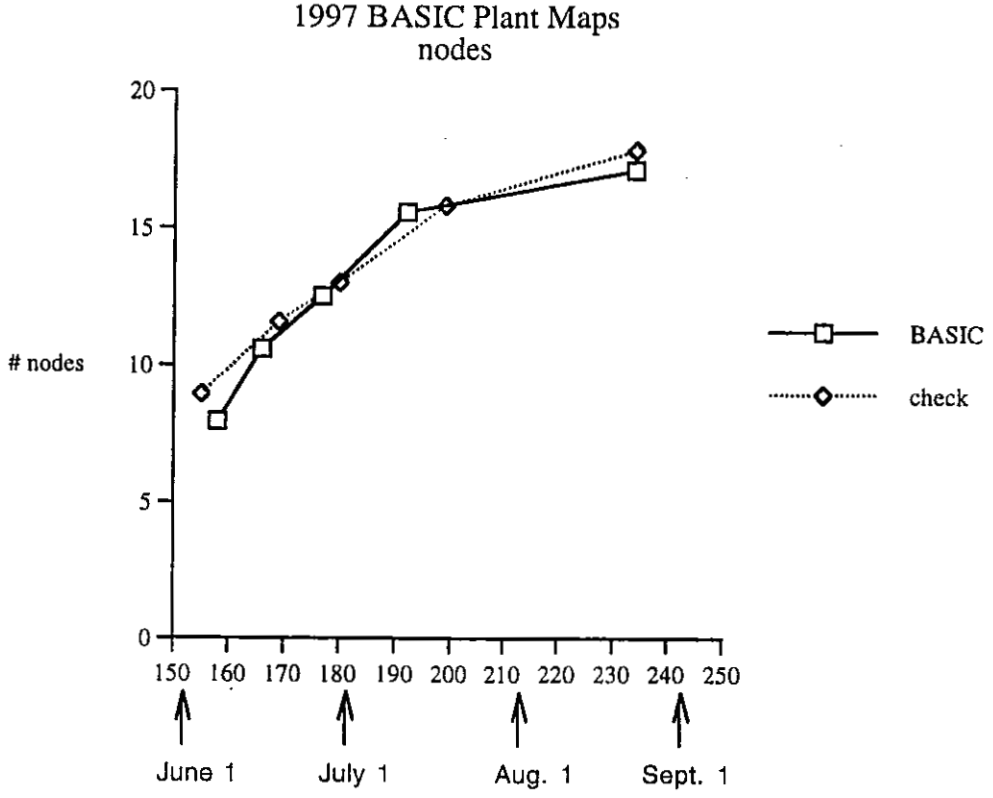

1997 BASIC sweep insects
total assassin bugs
total Reduviids
1.5
1
0.5
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

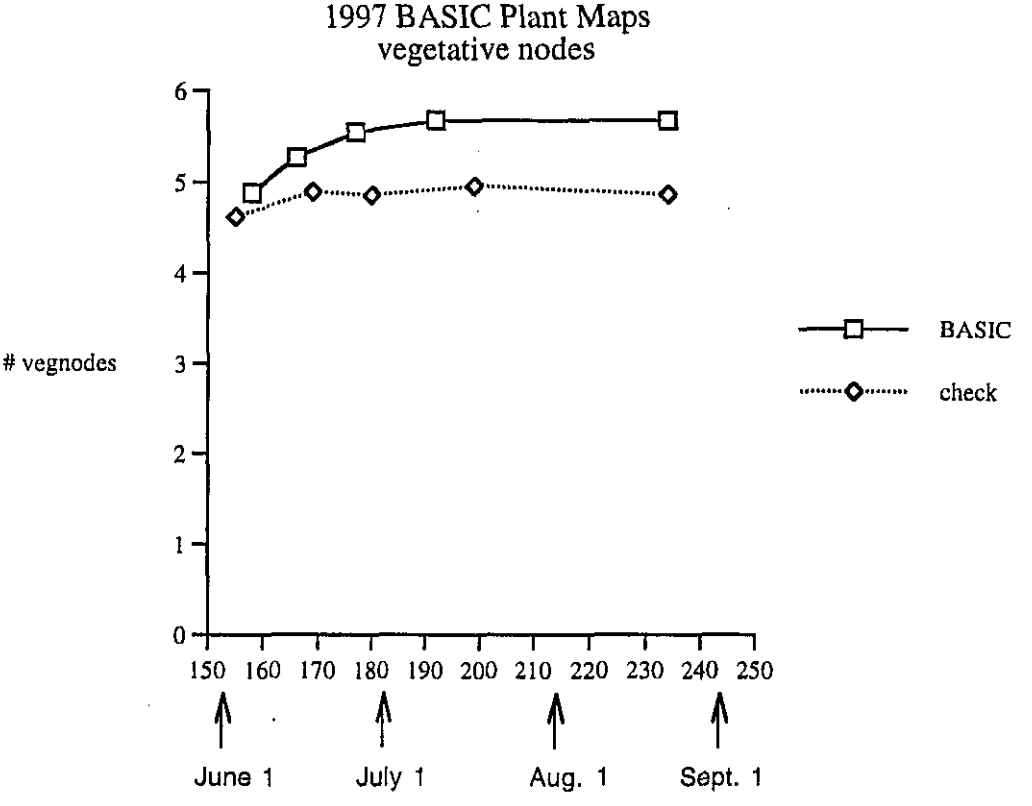

1997 BASIC sweep insects
spiders
spiders/50 sweeps
2
1.5
1
0.5
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

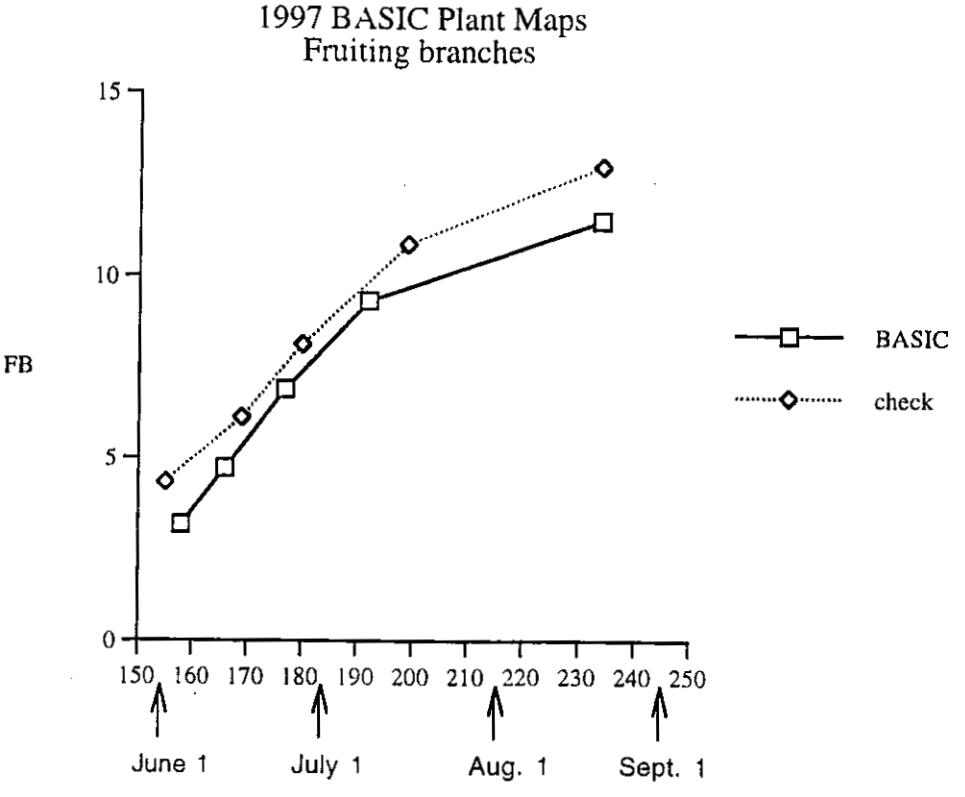

1997 BASIC sweep insects
total beneficial insects
total beneficial insects
40
30
20
10
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

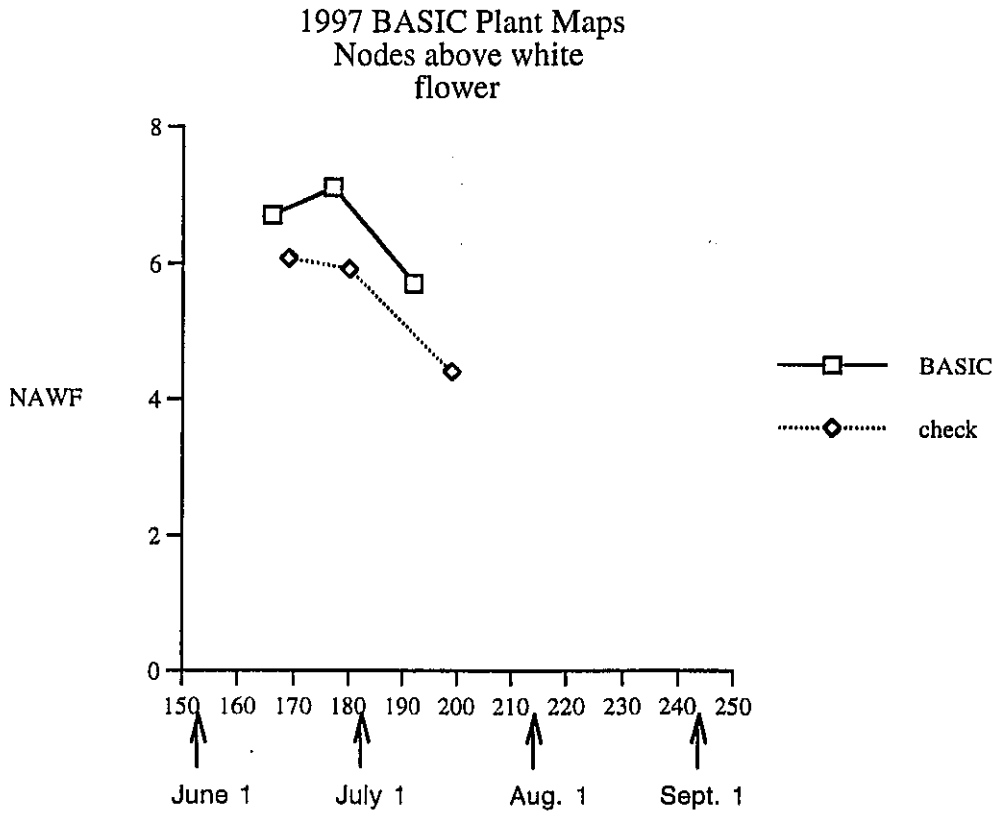

1997 BASIC sweep insects
total juvenile beneficial insects
12.5
10
7.5
5
2.5
0
total juveniles
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check


1997 BASIC Plant Maps
height
ht, in.
40
30
20
10
0
150 160 170 180 190 200 210 220 230 240 250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check

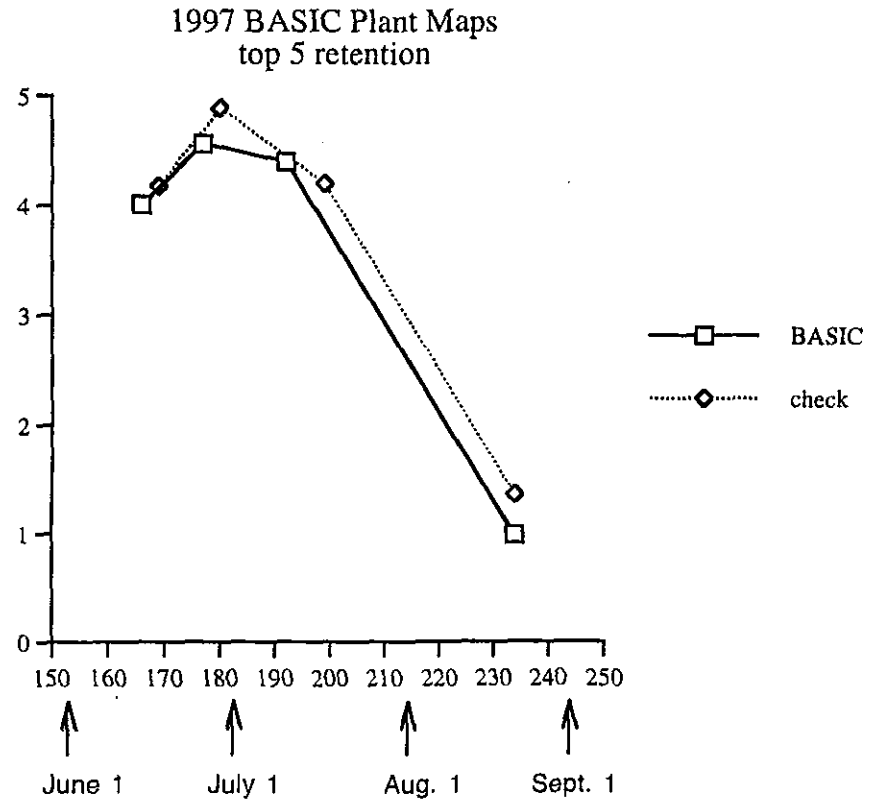

1997 BASIC Plant Maps
nodes
nodes
20
15
10
5
0
150 160 170 180 190 200 210 220 230 240 250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check

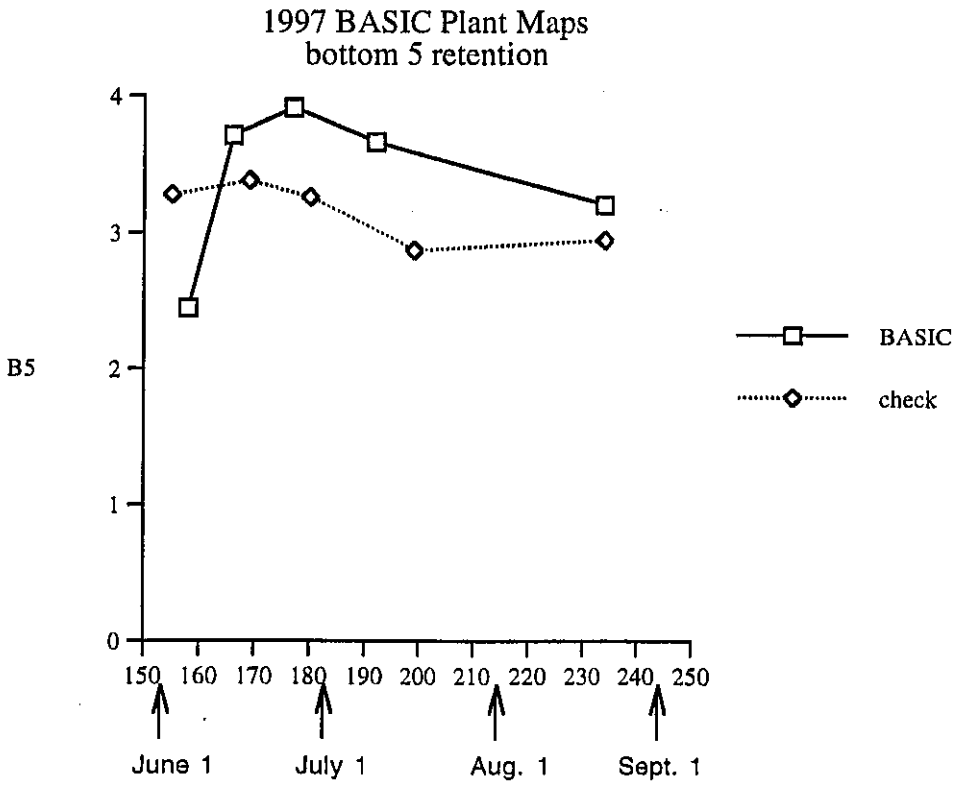

1997 BASIC Plant Maps
vegetative nodes
vegnodes
0
1
2
3
4
5
6
150 160 170 180 190 200 210 220 230 240 250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check

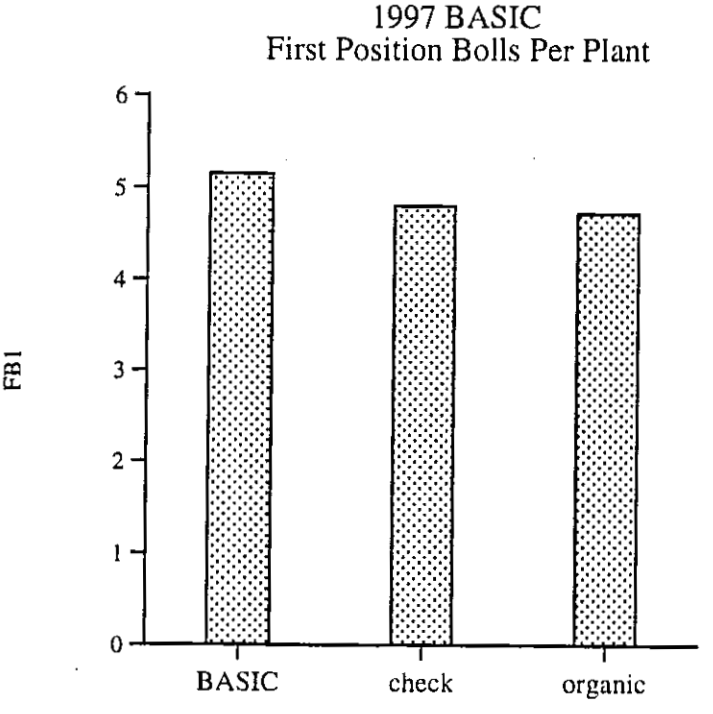

1997 BASIC Plant Maps
Fruiting branches
FB
15
10
5
0
150 160 170 180 190 200 210 220 230 240 250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check

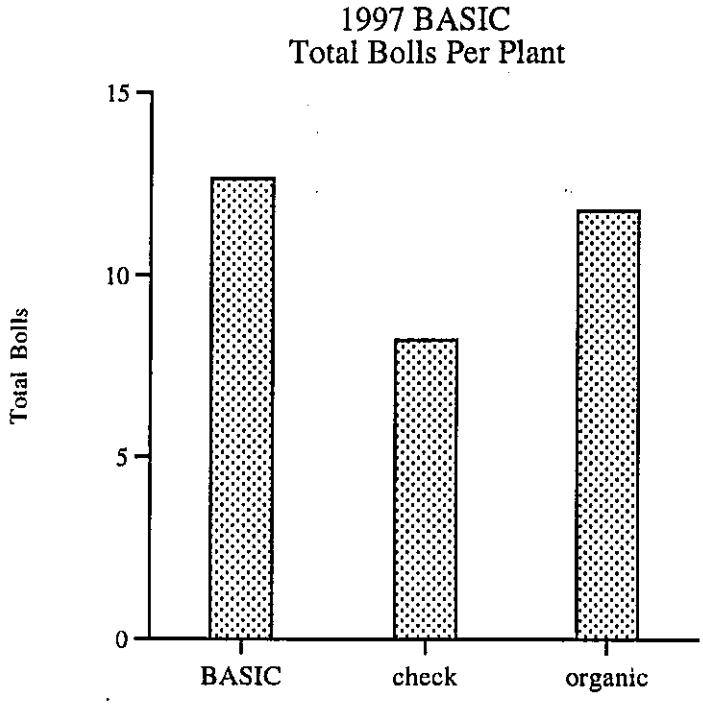

1997 BASIC Plant Maps
Nodes above white
flower
NAWF
8
6
4
2
0
150 160 170 180 190 200 210 220 230 240 250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check

T5

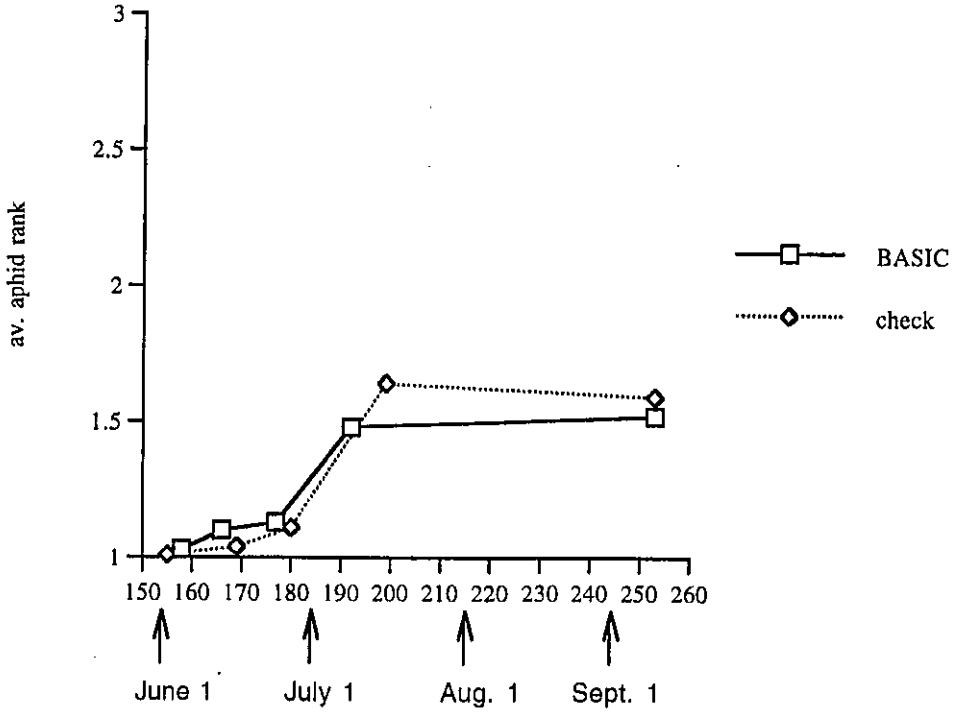

1997 BASIC Plant Maps
top 5 retention
5
4
3
2
1
0
150 160 170 180 190 200 210 220 230 240 250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check

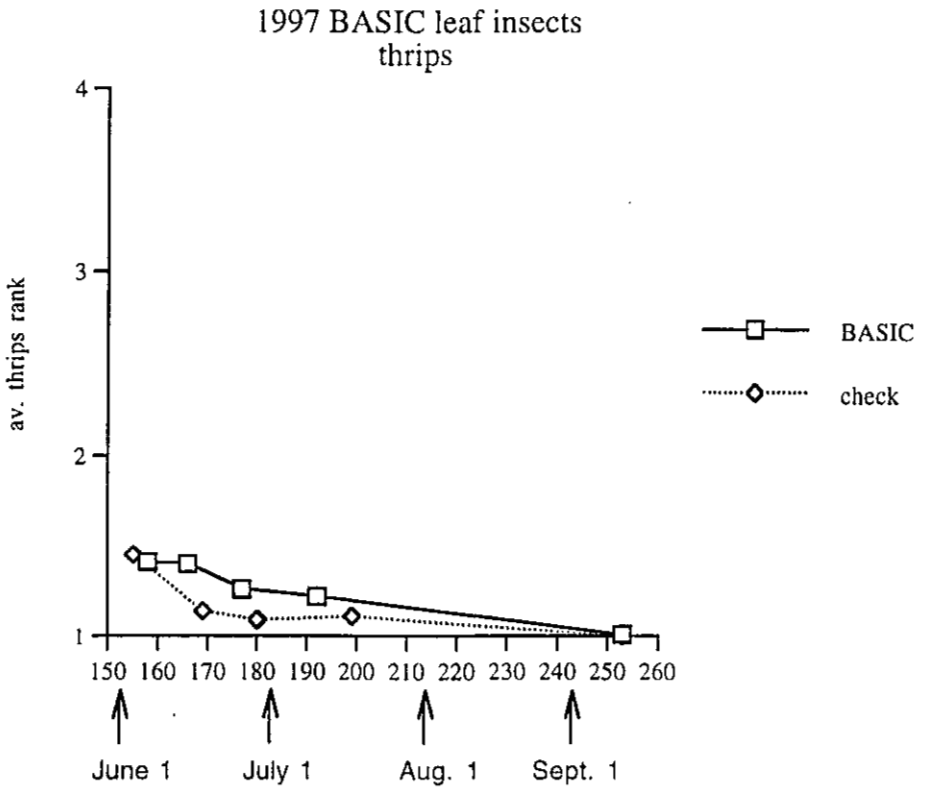

1997 BASIC Plant Maps
bottom 5 retention
B5
4
3
2
1
0
150 160 170 180 190 200 210 220 230 240 250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check


1997 BASIC
First Position Bolls Per Plant
FB1
6
5
4
3
2
1
0
BASIC
check
organic

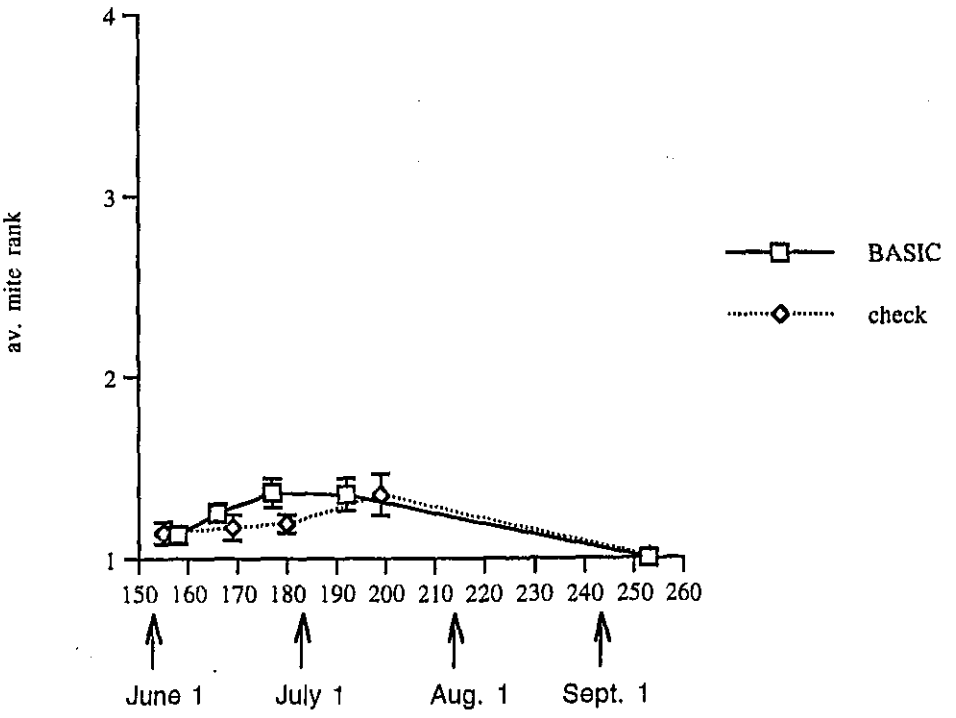

1997 BASIC
Total Bolls Per Plant
Total Bolls
15
10
5
0
BASIC
check
organic

1997 BASIC leaf insects
aphids




1997 BASIC leaf insects
thrips
av. thrips rank
4
3
2
1
150 160 170 180 190 200 210 220 230 240 250 260
June 1
July 1
Aug. 1
Sept. 1
BASIC
check

1997 BASIC Leaf Insects
mites



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CENTER FOR AGROECOLOGY
AND SUSTAINABLE FOOD SYSTEMS

SANTA CRUZ, CALIFORNIA 95064

12 January 1998

Dear cotton growers:

Enclosed is the final update from the BASIC plant mapping and insect sampling efforts, extending through harvest. This update differs from prior ones in that the final plant map sample includes a total boll count and yield data. Fields have the same code as in the prior updates. This is your code:
Code: trtmt: _____ rep: _____

Tables: Each number in the tables represents an *average*. For the leaf insect and plant map tables, each number is an average of 20 plants or 20 leaves on each date in each field. There are no new sweep insect data. The estimates of plants per acre and yields are averages of four 1000th-acre samples per field. These tables are not intended to substitute for pest control information and recommendations made by a licensed pest control advisor.

Graphs: Graphs show a picture of averages for each treatment (BASIC or check), to give you an idea of how the two treatments performed through the season. We have included insect and plant development graphs from the whole season; many of these are identical to those in the Sept. update. For the final harvest sample, we separated the organic BASIC component from the full compliment of BASIC fields in the graphs.

What do the graphs mean? None of the major northern San Joaquin Valley cotton pests (mites, aphids, and *Lygus*) caused significant problems in this study in 1997. Lygus numbers did increase to over a ten count in the BASIC fields in early August, but this was past the critical period of square retention and did not lead to excess shedding. Beneficial insect numbers (mostly bigeyed bugs and minute pirate bugs) remained high in both BASIC and check fields through the season, with numbers slightly higher in BASIC fields. These insects may have played an important role in pest management, especially in BASIC fields.

Plants in BASIC and check fields were similar through the season in most development parameters, but BASIC plants had slightly more vegetative nodes. Total boll production per plant was higher in both BASIC and organic BASIC fields than in check fields, mostly because of higher production of outer position bolls in all BASIC fields. However, because of differences in plant density between the treatments, the total number of bolls per *acre* was lower in BASIC and organic BASIC fields than in check fields. This translated to lower yields as determined both by pick plot sample and by early yield estimation (done by extrapolating from number of bolls per acre). This result differs from results in prior years, in which organic fields made up for low plant densities with increased production of outer position bolls, resulting in yields equivalent to those in check fields. Yield losses this year may have been due to the early cutout date (~ Aug. 4), which prevented heavy reliance on late season, outer position boll production.

If you have any questions about these graphs or charts, please feel free to contact Sean Swezey at (408) 459-4367. As the final activity of the 1997 season, we will interview each of you about your production practices and inputs. We are offering a $50 honorarium to you for this interview. We will be contacting you within the next few weeks to set up an interview date.

Sincerely,

Sean L. Swezey and Polly Goldman
Center for Agroecology and Sustainable Food Systems
University of California
Santa Cruz, CA 95064
(408) 459-4367

1997 BASIC
Final Plant Map and Yield Estimates

treatment	rep	plant ht (inches)	# nodes	av. internode length (in)	# nodes to 1st FB	# FB	# 1st pos. OBs	# 2nd pos. OBs	#3rd pos. OBs	1-5 1st pos. retention	# GB	total OB	# plants per acre	yield (seed cotton) lbs/.001ac	yield (seed cotton) lbs/acre	yield (ginned cotton) lbs/acre	yield (ginned cotton) bales/acre
B	1	40.05	20.80	1.97	5.80	15.00	5.05	1.95	1.00	2.80	0.10	8.00	33750	2.90	2719	870.0	1.81
B	2	33.48	20.55	1.65	6.40	14.15	4.85	2.65	1.75	3.35	0.20	9.25	22500	2.90	2719	870.0	1.81
B	3	30.23	21.55	1.41	7.30	14.25	4.15	1.45	1.55	3.25	0.25	7.15	27000	2.70	2531	810.0	1.69
B	4	30.53	21.00	1.46	5.40	15.60	5.10	1.35	0.40	3.20	0.00	6.85	33000	3.00	2813	956.3	1.99
B	5	37.23	18.45	2.05	3.80	14.65	3.30	1.05	1.10	2.00	0.10	5.45	39000	2.20	2063	660.0	1.38
B	6	26.10	18.40	1.42	5.60	12.80	5.35	1.70	0.75	2.90	0.30	7.80	51250	3.50	3281	1082.8	2.26
B	7	28.86	14.25	1.14	6.20	11.50	3.71	1.43	0.29	2.57	0.00	5.43	55750	3.30	3094	1061.2	2.21
B	8	34.05	21.80	1.59	4.00	17.80	4.10	1.50	0.55	2.35	0.40	6.15	50750	3.20	3000	960.0	2.00
B	9	39.20	24.60	1.64	5.50	19.10	4.45	2.30	1.70	2.40	0.30	8.45	36000	4.40	4125	1443.8	3.01
B	10	30.23	18.60	1.61	7.00	11.60	3.65	1.35	2.05	2.25	0.05	7.05	32500	2.30	2156	733.1	1.53
B	12	41.40	26.70	1.55	5.20	21.50	6.35	2.30	2.50	3.65	0.75	11.15	28750	3.50	3281	1115.6	2.32
C	1	32.93	18.85	1.76	4.30	14.55	6.00	2.00	0.45	3.50	0.00	8.45	56250	4.90	4594	1745.6	3.64
C	2	32.93	18.90	1.76	4.20	14.70	5.15	1.25	0.10	2.70	0.10	6.50	54750	3.60	3375	1282.5	2.67
C	3	41.03	19.75	2.10	5.10	14.65	4.05	1.55	0.60	2.30	0.00	6.20	48750	3.70	3469	1318.1	2.75
C	4	28.23	19.90	1.42	4.80	15.10	5.30	0.50	0.10	3.65	0.05	5.90	51250	3.10	2906	988.1	2.06
C	5	33.60	18.15	1.86	4.60	13.55	5.70	1.00	0.10	3.30	0.00	6.80	53500	4.30	4031	1370.6	2.86
C	6	34.10	19.30	1.78	4.50	14.80	5.75	1.10	0.50	3.15	0.20	7.35	54250	3.70	3469	1318.1	2.75
C	7	32.35	18.50	1.78	4.40	14.10	3.45	0.65	0.00	2.45	0.00	4.10	64250	pick-plot data not available			
C	8	29.08	16.90	1.73	4.50	12.40	4.60	1.35	0.10	2.65	0.00	6.05	62650	4.10	3844	1306.9	2.72
C	9	28.60	19.85	1.46	4.50	15.35	4.30	0.75	0.75	3.25	0.20	5.80	54250	3.20	3000	1140.0	2.38
C	10	36.85	19.90	1.87	5.70	14.20	3.70	0.65	0.55	2.35	0.05	4.90	51000	2.80	2625	997.5	2.08
C	11	33.08	19.55	1.71	6.60	12.95	4.55	0.95	1.05	2.85	0.15	6.55	58250	4.00	3750	1425.0	2.97

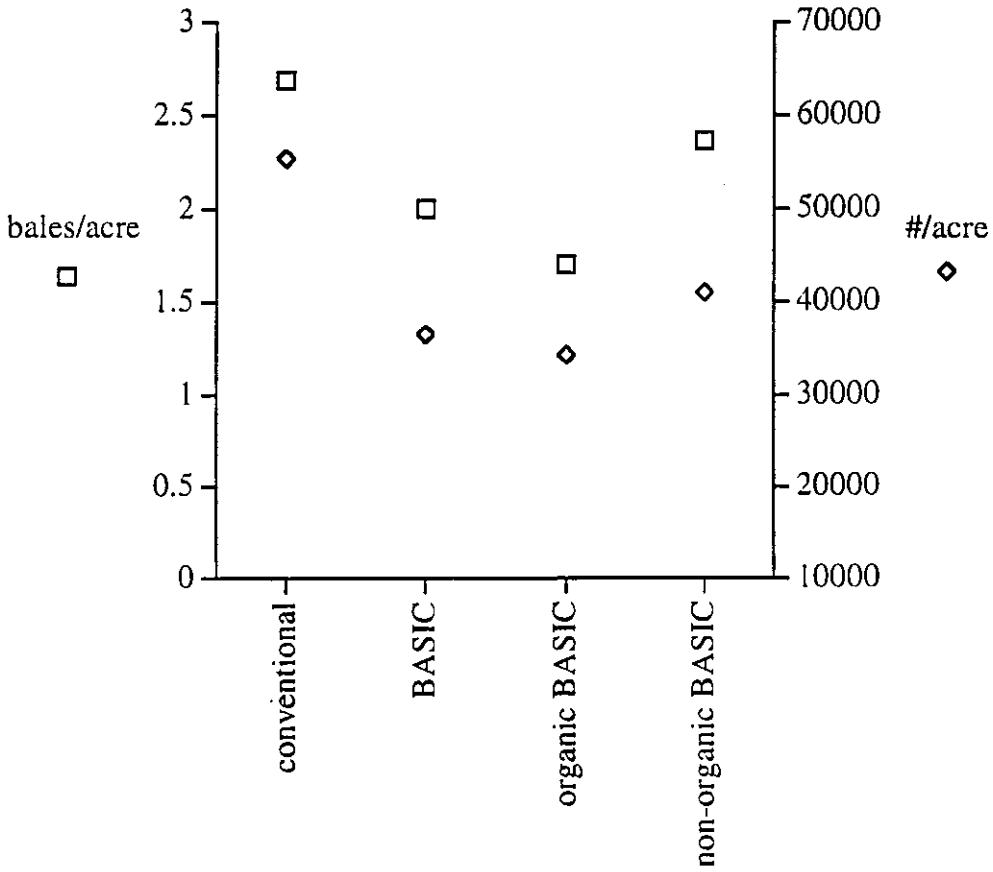
1997 BASIC Leaf Insects
Field Averages

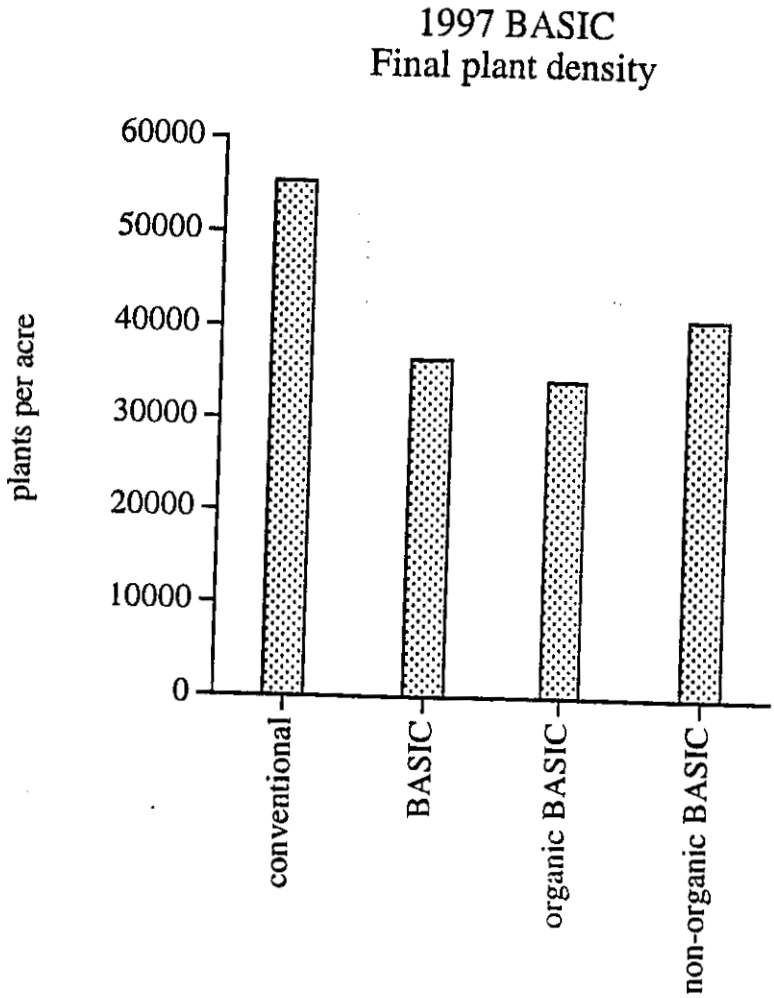
date	trtmt	rep	mite rank	mite eggs	%mite	thrips	aphids	minute pirate bugs	lacewing eggs & larvae	bigeyed bug eggs & nymphs	total predators
6/2	B	1	1.15	1.05	15.00	1.45	1.05	0.10	0.00	0.00	0.10
6/2	B	2	1.00	1.00	0.00	1.60	1.00	0.00	0.05	0.00	0.05
6/3	B	3	1.00	1.00	0.00	1.40	1.15	0.00	0.00	0.00	0.00
6/3	B	4	1.05	1.05	5.00	1.20	1.00	0.00	0.00	0.05	0.05
6/11	B	5	1.30	1.20	25.00	1.25	1.00	0.05	0.00	0.10	0.15
6/4	B	6	1.60	1.50	50.00	2.05	1.05	0.00	0.00	0.00	0.00
6/4	B	7	1.10	1.10	10.00	1.65	1.05	0.00	0.05	0.05	0.10
6/11	B	8	1.15	1.10	15.00	1.30	1.00	0.00	0.05	0.15	0.20
6/4	B	9	1.00	1.00	0.00	1.30	1.00	0.00	0.00	0.00	0.00
6/3	B	10	1.05	1.05	5.00	1.35	1.00	0.00	0.00	0.00	0.00
6/3	B	11	1.05	1.00	5.00	1.15	1.00	0.00	0.00	0.00	0.00
6/6	B	12	1.10	1.05	10.00	1.20	1.00	0.05	0.00	0.00	0.05
6/12	C	1	1.40	1.20	25.00	2.00	1.00	0.00	0.00	0.00	0.00
6/12	C	2	1.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
6/12	C	3	1.00	1.00	0.00	1.20	1.00	0.00	0.05	0.00	0.05
6/4	C	4	1.50	1.45	45.00	2.35	1.00	0.00	0.00	0.00	0.00
6/4	C	5	1.40	1.35	35.00	1.65	1.00	0.10	0.05	0.10	0.25
6/12	C	6	1.00	1.00	0.00	1.25	1.00	0.05	0.00	0.00	0.05
6/4	C	7	1.10	1.10	10.00	1.50	1.00	0.00	0.10	0.00	0.10
6/12	C	8	1.00	1.00	0.00	1.15	1.00	0.05	0.05	0.00	0.10
6/4	C	9	1.10	1.10	10.00	1.55	1.05	0.00	0.00	0.00	0.00
6/11	C	10	1.00	1.00	0.00	1.10	1.00	0.00	0.00	0.00	0.00
6/11	C	11	1.00	1.00	0.00	1.25	1.10	0.00	0.00	0.00	0.00
6/12	B	1	1.05	1.05	5.00	1.20	1.00	0.00	0.00	0.00	0.00
6/13	B	2	1.15	1.15	15.00	1.50	1.05	0.00	0.00	0.00	0.00
6/13	B	3	1.25	1.20	20.00	1.65	1.45	0.00	0.00	0.05	0.05
6/13	B	4	1.05	1.05	40.00	1.10	1.05	0.00	0.00	0.00	0.20
6/17	B	5	1.50	1.40	45.00	1.60	1.00	0.00	0.05	0.05	0.10
6/17	B	6	1.55	1.45	45.00	1.80	1.00	0.30	0.00	0.00	0.30
6/17	B	7	1.30	1.20	20.00	1.35	1.05	0.00	0.00	0.00	0.00
6/17	B	8	1.30	1.30	30.00	1.25	1.05	0.10	0.15	0.05	0.30
6/18	B	9	1.25	1.20	20.00	1.15	1.40	0.00	0.05	0.00	0.05
6/13	B	10	1.35	1.30	30.00	1.30	1.00	0.00	0.05	0.00	0.05
6/13	B	12	1.05	1.05	5.00	1.45	1.00	0.00	0.00	0.00	0.00
6/18	C	1	1.20	1.20	35.00	1.20	1.10	0.00	0.00	0.00	0.00
6/18	C	2	1.00	1.00	0.00	1.00	1.05	0.00	0.10	0.00	0.10
6/18	C	4	1.60	1.45	50.00	1.30	1.00	0.15	0.20	0.00	0.35
6/19	C	5	1.05	1.05	10.00	1.05	1.00	0.00	0.00	0.00	0.00
6/18	C	6	1.00	1.00	0.00	1.35	1.00	0.05	0.00	0.00	0.05
6/19	C	8	1.00	1.00	0.00	1.05	1.00	0.00	0.05	0.00	0.05
6/18	C	9	1.35	1.30	30.00	1.00	1.15	0.00	0.00	0.00	0.00
6/20	B	1	1.35	1.20	35.00	1.50	1.05	0.05	0.20	0.00	0.25
6/20	B	2	1.10	1.10	10.00	1.45	1.20	0.00	0.10	0.00	0.10
6/23	B	3	1.35	1.25	30.00	1.25	1.30	0.05	0.05	0.00	0.10
6/25	B	4	1.40	1.35	15.00	1.30	1.10	0.20	0.00	0.25	0.40
6/30	B	5	1.60	1.45	55.00	1.35	1.00	0.10	0.00	0.00	0.10
7/2	B	6	1.10	1.10	20.00	1.10	1.15	0.00	0.10	0.00	0.10
7/1	B	7	1.25	1.20	25.00	1.15	1.10	0.20	0.10	0.05	0.35
6/30	B	8	1.95	1.60	70.00	1.05	1.00	0.30	0.05	0.30	0.65
6/25	B	9	1.20	1.15	20.00	1.35	1.30	0.10	0.15	0.00	0.25
6/25	B	10	1.20	1.20	20.00	1.25	1.10	0.00	0.20	0.00	0.20
6/26	B	11	1.75	1.60	60.00	1.20	1.20	0.05	0.15	0 10	0.30
6/20	B	12	1.10	1.05	10.00	1.15	1.00	0.00	0.05	0 00	0.05
7/2	C	1	1.05	1.05	15.00	1.00	1.05	0.00	0.10	0.00	0.10
7/2	C	2	1.40	1.25	30.00	1.00	1.05	0.00	0.05	0.00	0.05
7/2	C	3	1.45	1.30	40.00	1.20	1.05	0.25	0.10	0.05	0.40

1997 BASIC Leaf Insects
Field Averages

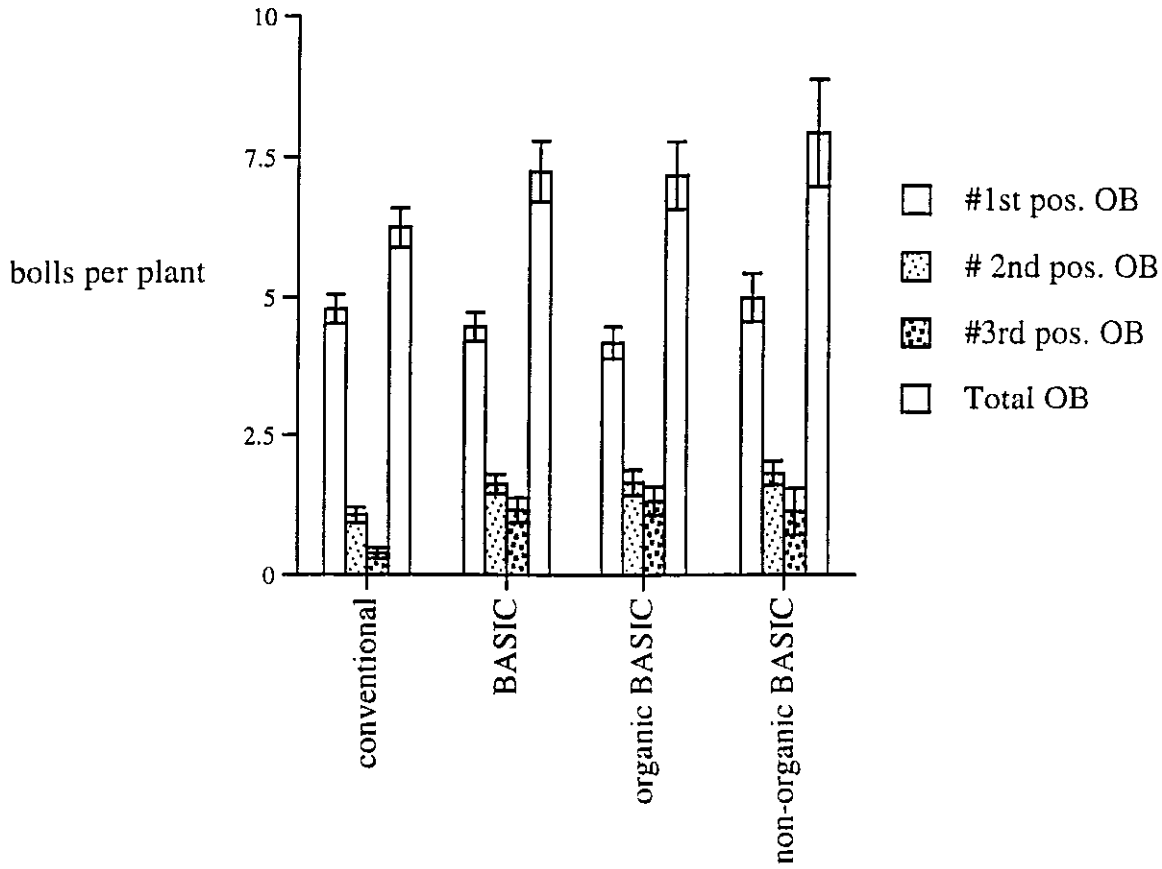
date	trtmt	rep	mite rank	mite eggs	%mite	thrips	aphids	minute pirate bugs	lacewing eggs & larvae	bigeyed bug eggs & nymphs	total predators
7/1	C	4	1.05	1.05	10.00	1.05	1.20	0.00	0.05	0.05	0.10
7/1	C	5	1.05	1.05	10.00	1.10	1.05	0.10	0.05	0.00	0.15
7/2	C	6	1.00	1.00	0.00	1.15	1.30	0.00	0.05	0.00	0.05
7/1	C	7	1.20	1.20	20.00	1.10	1.00	0.00	0.00	0.00	0.00
7/1	C	8	1.10	1.05	5.00	1.10	1.05	0.10	0.00	0.00	0.10
6/26	C	9	1.35	1.25	30.00	1.05	1.45	0.00	0.10	0.00	0.15
7/2	C	10	1.30	1.25	30.00	1.05	1.00	0.05	0.00	0.05	0.10
6/30	C	11	1.10	1.10	10.00	1.15	1.00	0.10	0.00	0.00	0.10
7/7	B	1	1.80	1.55	65.00	1.55	1.10	0.20	0.25	0.30	0.75
7/9	B	2	1.10	1.05	10.00	1.15	1.15	0.00	0.10	0.00	0.10
7/9	B	3	1.40	1.35	35.00	1.25	1.50	0.00	0.20	0.00	0.20
7/9	B	4	1.45	1.35	15.00	1.25	1.55	0.00	0.00	0.05	0.35
7/17	B	5	1.75	1.65	70.00	1.25	1.50	0.15	0.10	0.15	0.40
7/10	B	6	1.00	1.00	10.00	1.15	1.30	0.00	0.00	0.00	0.00
7/16	B	7	1.10	1.10	10.00	1.05	2.25	0.15	0.10	0.05	0.30
7/21	B	8	1.20	1.20	20.00	1.20	1.75	0.30	0.05	0.00	0.35
7/15	B	9	1.15	1.10	15.00	1.05	1.15	0.20	0.05	0.05	0.30
7/10	B	10	1.05	1.05	5.00	1.00	1.20	0.10	0.05	0.05	0.20
7/9	B	11	1.85	1.55	65.00	1.40	2.30	0.15	0.15	0.05	0.35
7/2	B	12	1.30	1.20	25.00	1.30	1.00	0.00	0.05	0.00	0.05
7/15	C	1	1.10	1.10	20.00	1.00	2.00	0.10	0.15	0.00	0.25
7/15	C	2	2.20	1.80	90.00	1.25	2.05	0.00	0.15	0.10	0.25
7/16	C	3	1.50	1.45	50.00	1.10	1.30	0.10	0.00	0.10	0.20
7/22	C	4	1.00	1.00	5.00	1.15	1.75	0.00	0.10	0.10	0.20
7/22	C	5	1.00	1.00	5.00	1.05	1.90	0.30	0.10	0.00	0.40
7/15	C	6	1.05	1.00	5.00	1.00	2.35	0.05	0.05	0.10	0.20
7/22	C	7	1.50	1.45	50.00	1.00	1.25	0.25	0.00	0.20	0.45
7/21	C	8	1.05	1.05	5.00	1.00	1.40	0.05	0.05	0.00	0.10
7/15	C	9	1.80	1.70	70.00	1.35	1.85	0.10	0.10	0.15	0.35
7/16	C	10	1.35	1.35	35.00	1.20	1.00	0.10	0.05	0.00	0.15
7/16	C	11	1.30	1.25	30.00	1.15	1.20	0.10	0.05	0.00	0.15
9/11	B	1	1.00	1.00	15.00	1.00	1.70	0.05	0.00	0.05	0.10
9/11	B	2	1.00	1.00	0.00	1.00	1.55	0.00	0.05	0.00	0.05
9/11	B	3	1.00	1.00	5.00	1.00	1.40	0.05	0.05	0.00	0.15
9/11	B	4	1.00	1.00	15.00	1.05	1.65	0.00	0.25	0.00	0.10
9/11	B	6	1.00	1.00	10.00	1.00	1.75	0.00	0.05	0.00	0.05
9/11	B	7	1.00	1.00	0.00	1.00	1.35	0.00	0.10	0.00	0.15
9/11	B	9	1.00	1.00	0.00	1.00	1.25	0.05	0.00	0.00	0.05
9/11	B	10	1.00	1.00	0.00	1.00	1.75	0.00	0.00	0.05	0.10
9/11	B	11	1.00	1.00	20.00	1.00	1.30	0.00	0.00	0.00	0.10
9/11	C	1	1.00	1.00	15.00	1.00	1.45	0.05	0.05	0.05	0.70
9/11	C	3	1.00	1.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
9/11	C	6	1.05	1.00	5.00	1.00	2.45	0.25	0.05	0.00	0.30
9/11	C	7	1.00	1.00	0.00	1.00	1.50	0.00	0.00	0.00	0.00
9/11	C	9	1.00	1.00	10.00	1.00	1.53	0.00	0.00	0.00	0.00
9/11	C	11	1.00	1.00	0.00	1.00	1.60	0.00	0.05	0.00	0.05
9/18	B	5	1.05	1.00	10.00	1.05	1.40	0.00	0.10	0.00	0.10
9/18	B	8	1.00	1.00	0.00	1.00	2.90	0.00	0.00	0.10	0.10
9/18	C	2	1.00	1.00	30.00	1.00	2.25	0.00	0.00	0.00	0.00
9/18	C	3	1.00	1.00	0.00	1.00	1.70	0.00	0.00	0.00	0.00
9/18	C	10	1.00	1.00	0.00	1.00	1.80	0.00	0.10	0.00	0.15

1997 BASIC
Yields and plant density

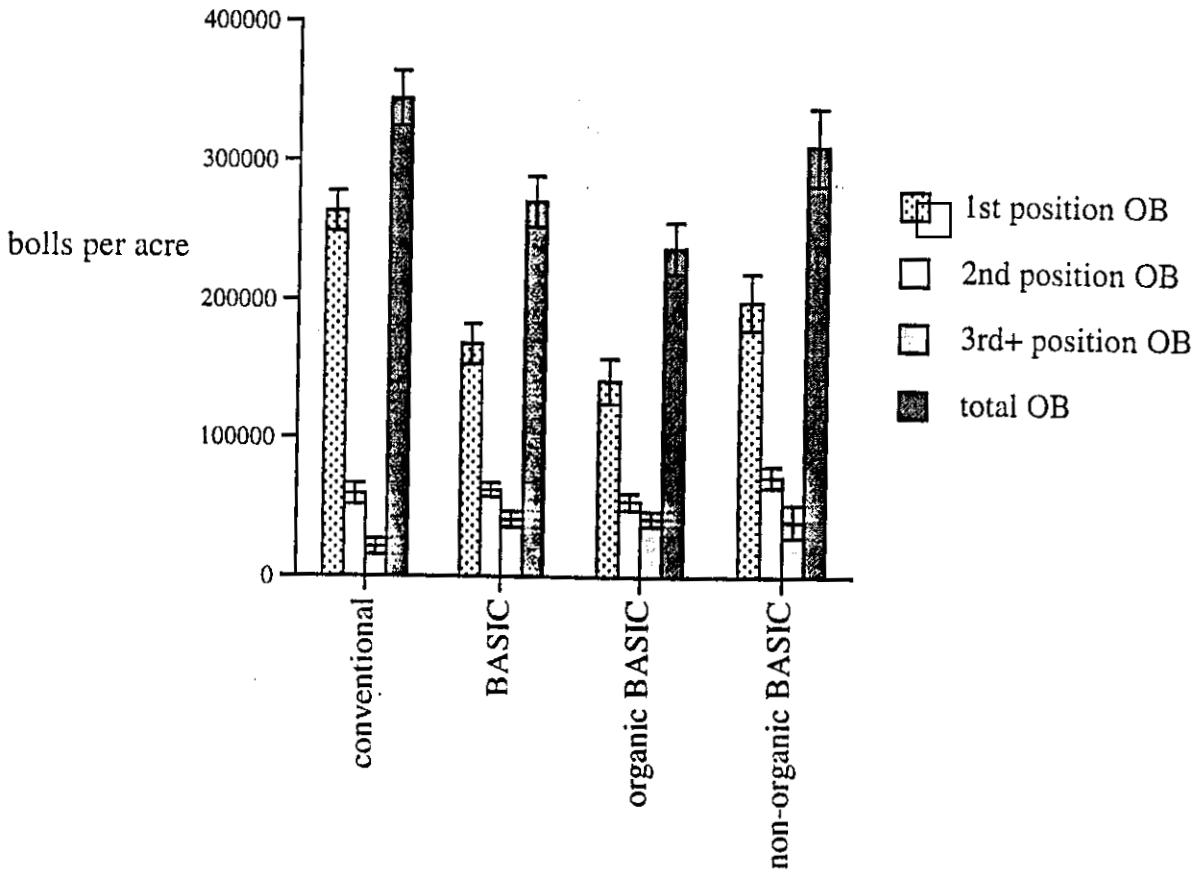


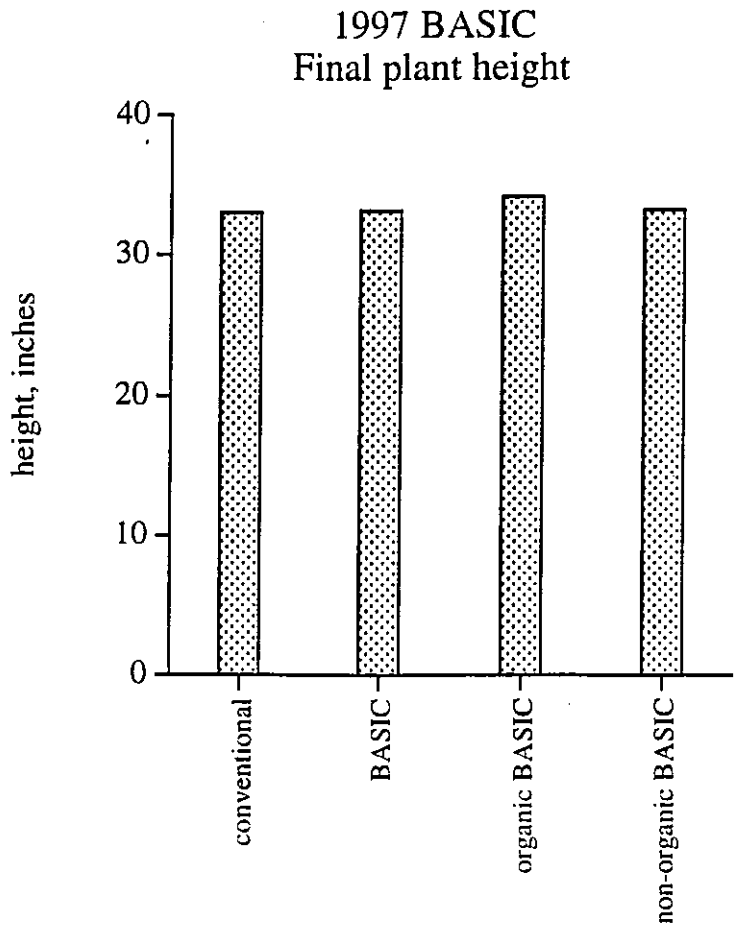

1997 BASIC
Final plant density
plants per acre
60000
50000
40000
30000
20000
10000
0
conventional
BASIC
organic BASIC
non-organic BASIC

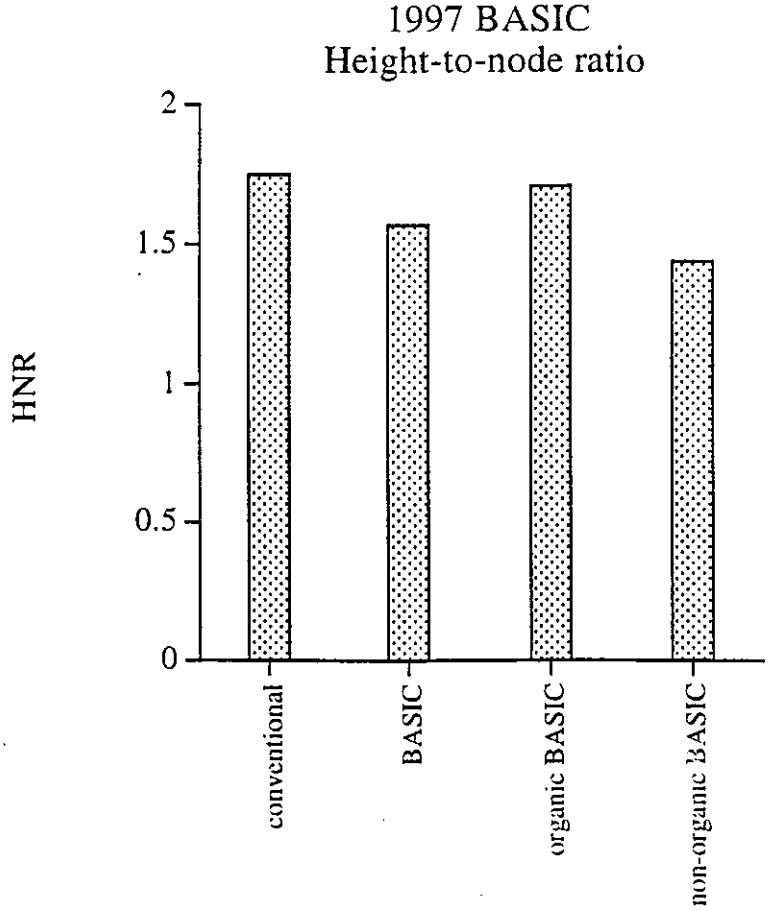
1997 BASIC
Boll production per plant



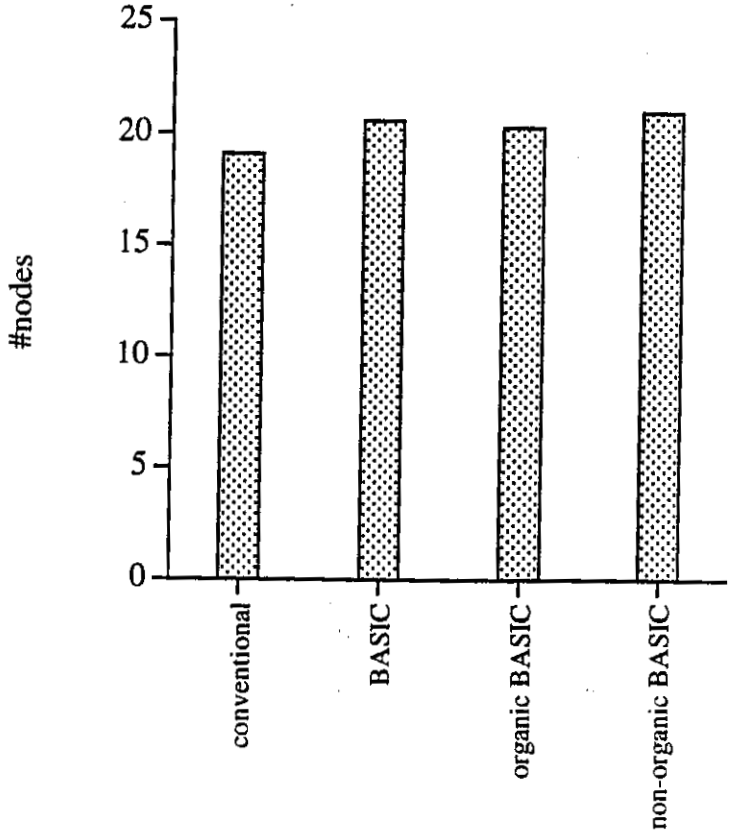
1997 BASIC
Boll production per acre



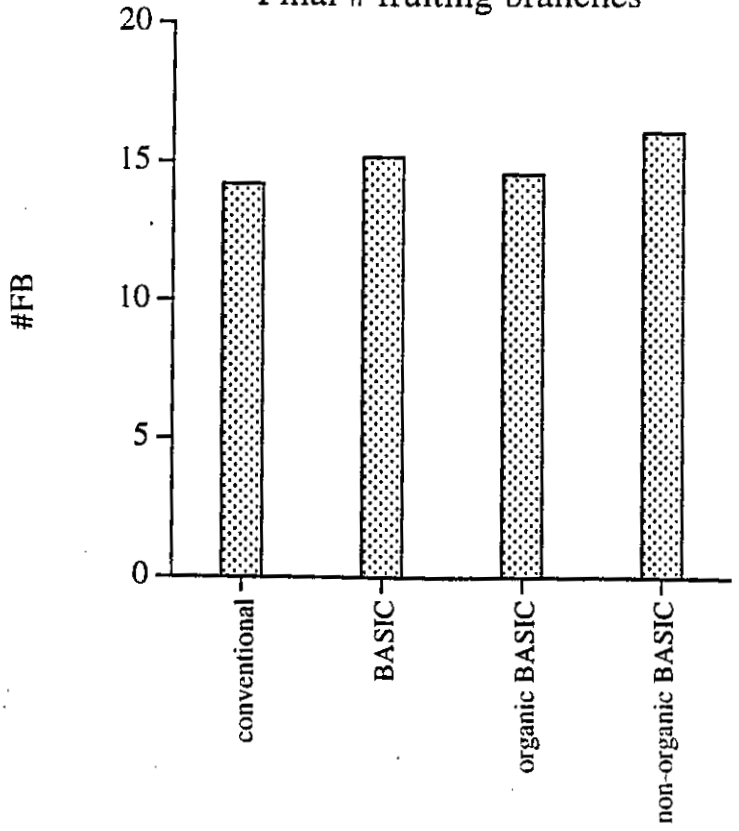

1997 BASIC
Final plant height
height, inches
40
30
20
10
0
conventional
BASIC
organic BASIC
non-organic BASIC

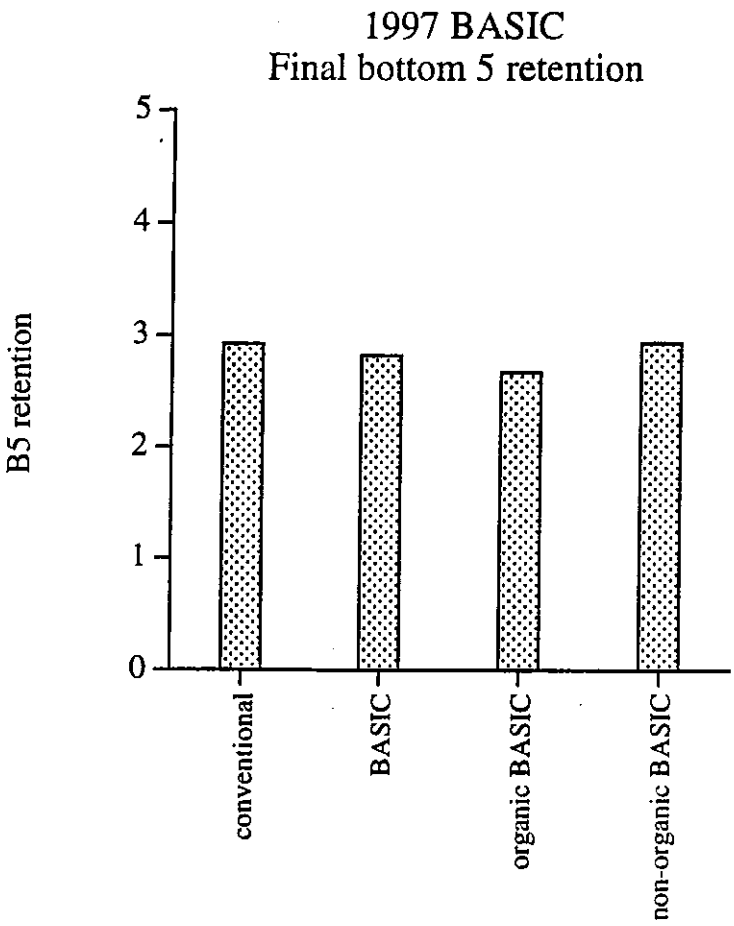

1997 BASIC
Height-to-node ratio
HNR
2
1.5
1
0.5
0
conventional
BASIC
organic BASIC
non-organic BASIC

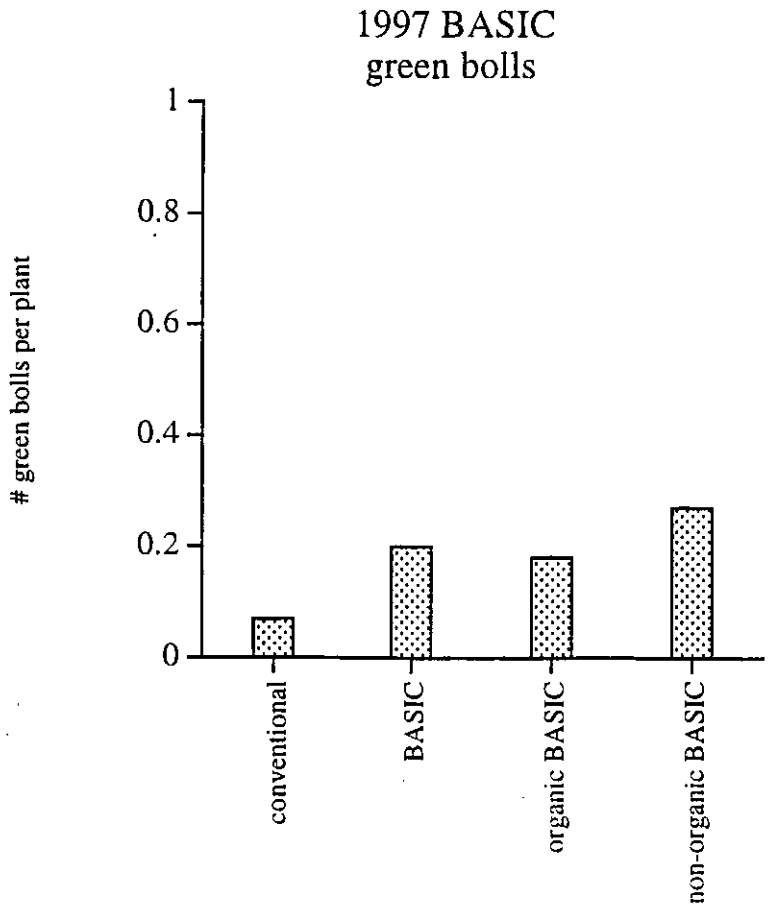
1997 BASIC
Final # nodes



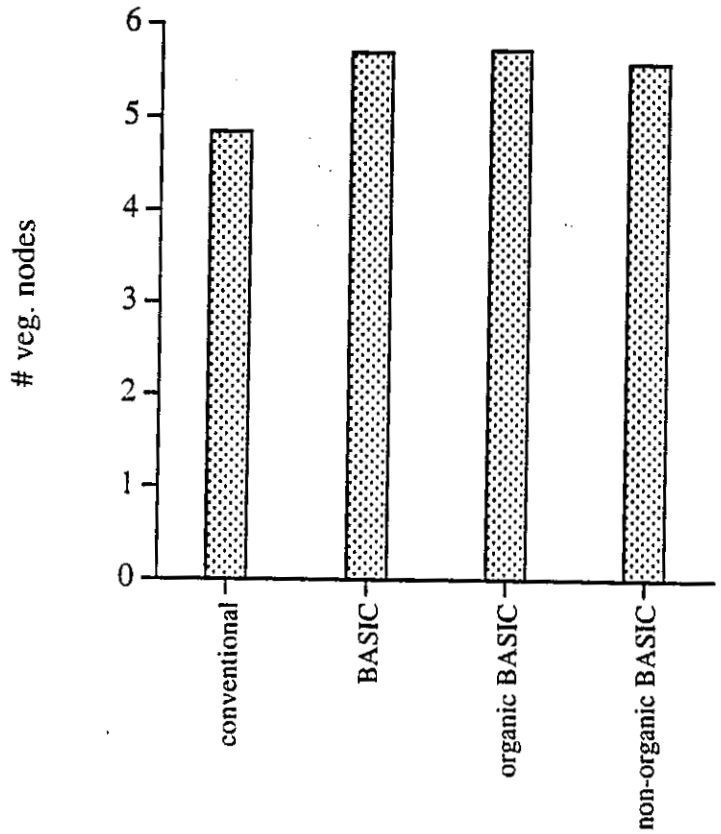
1997 BASIC
Final # fruiting branches



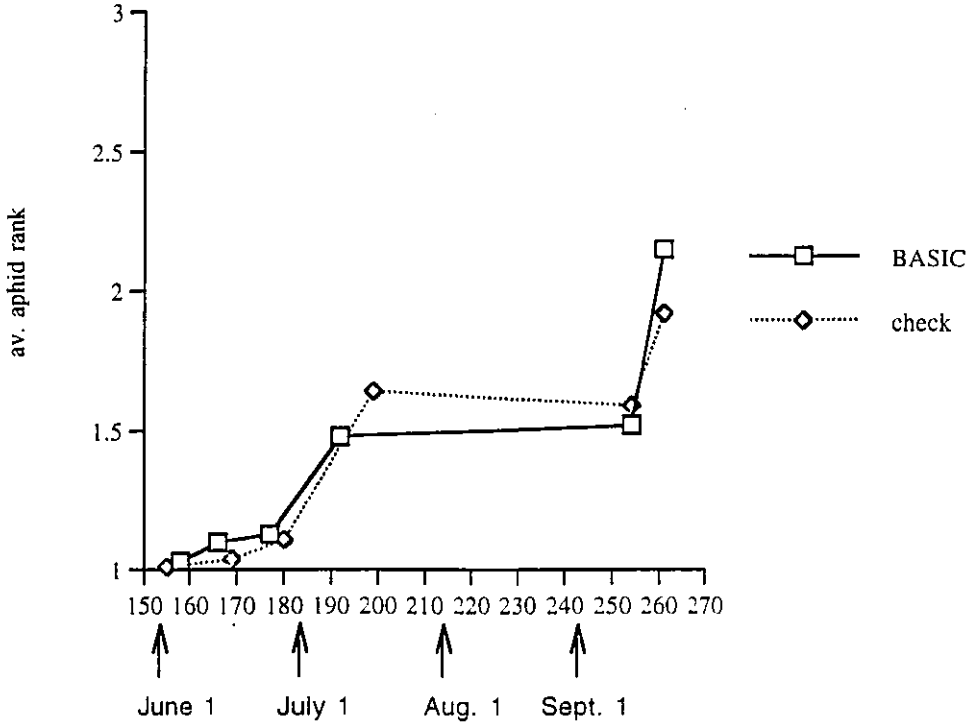

1997 BASIC
Final bottom 5 retention
B5 retention
5
4
3
2
1
0
conventional
BASIC
organic BASIC
non-organic BASIC

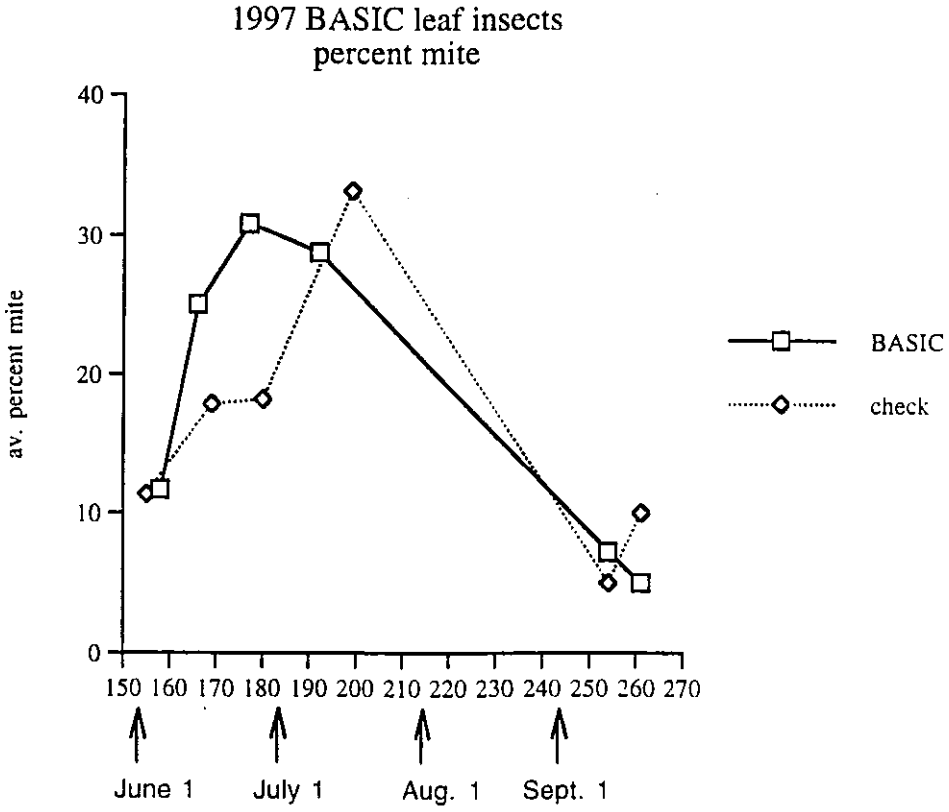

1997 BASIC
green bolls
green bolls per plant
1
0.8
0.6
0.4
0.2
0
conventional
BASIC
organic BASIC
non-organic BASIC

1997 BASIC
vegetative nodes

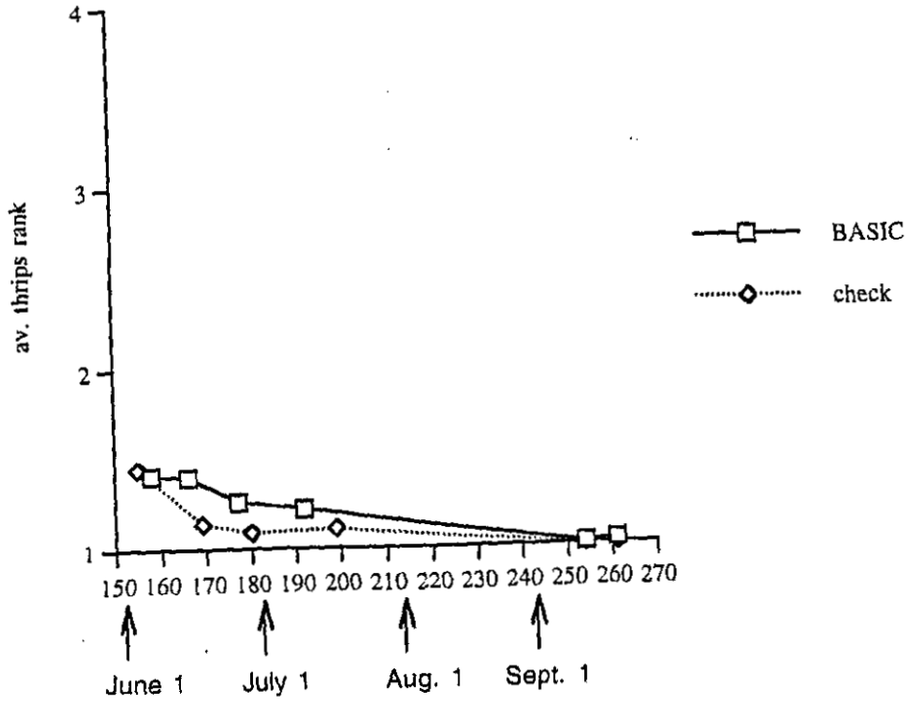


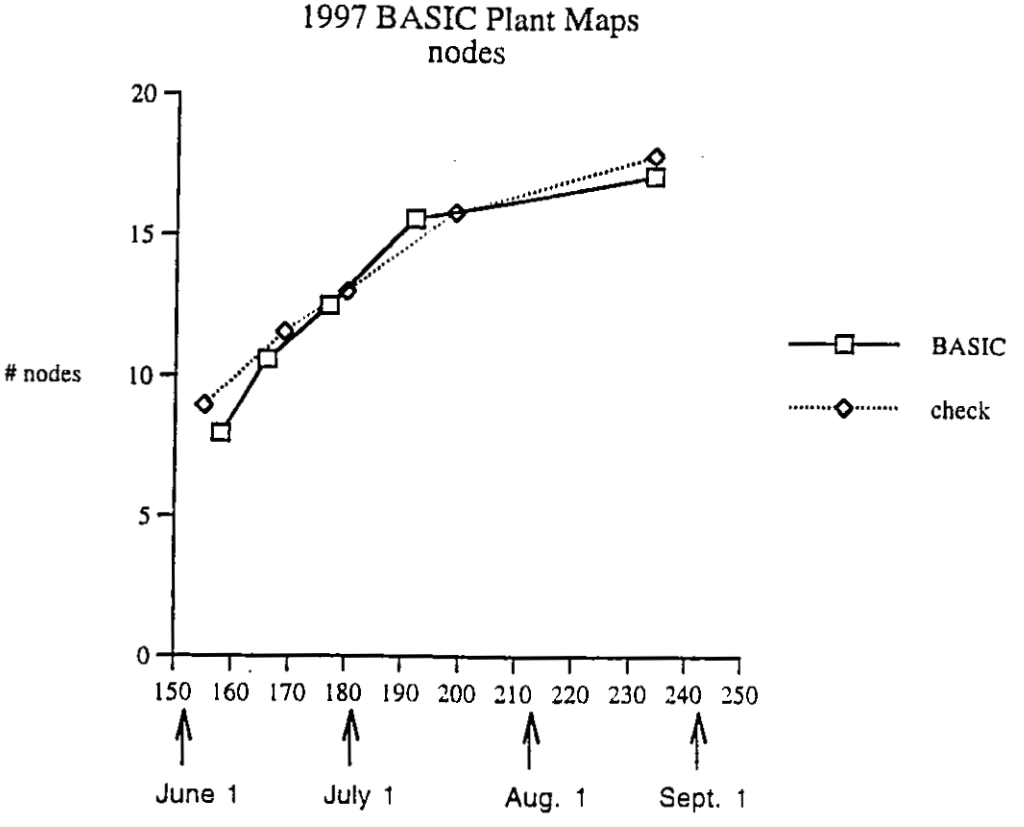
1997 BASIC leaf insects
aphids

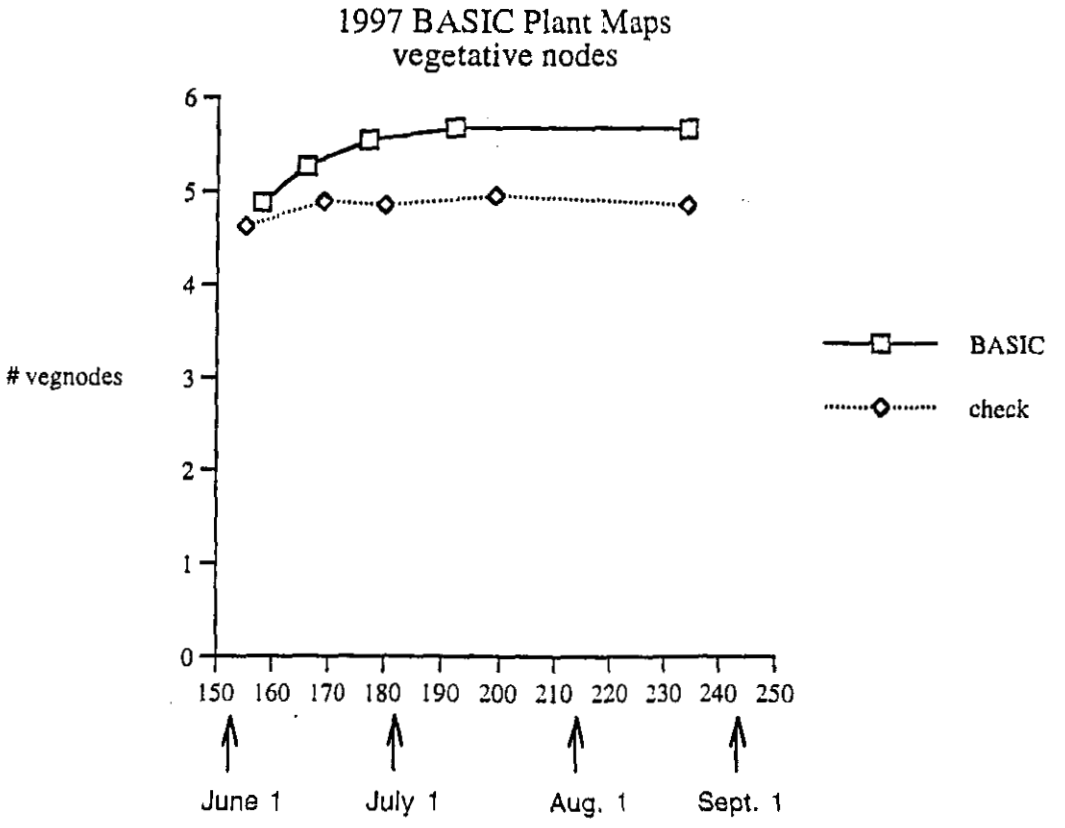


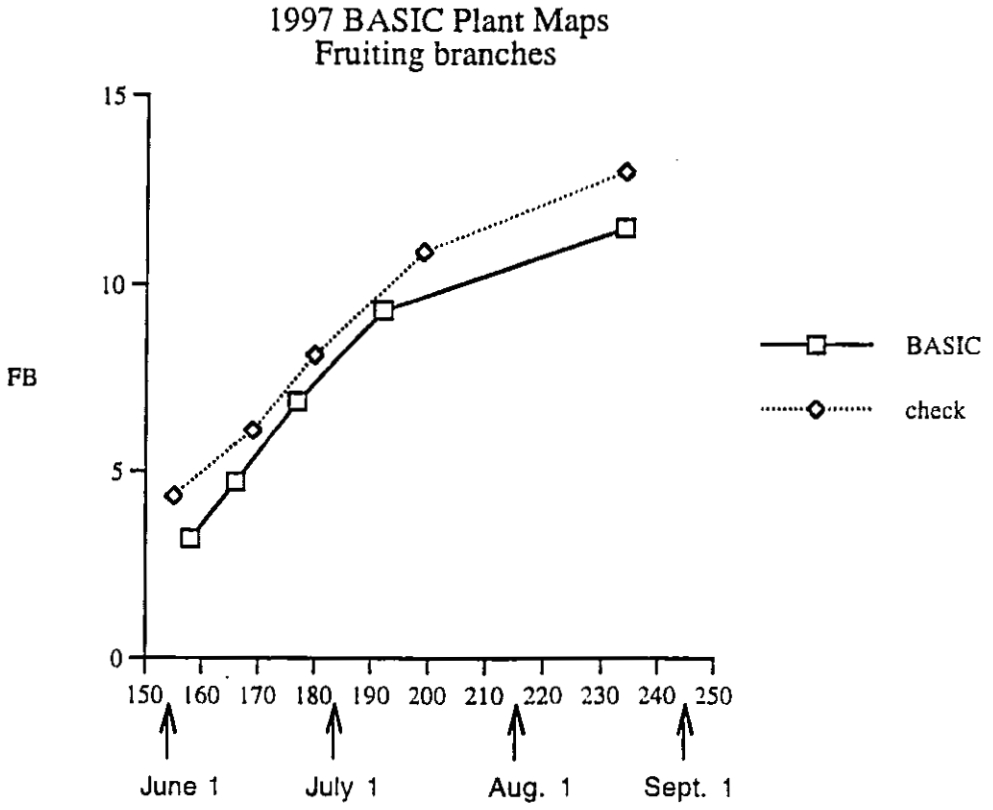

1997 BASIC leaf insects
percent mite
av. percent mite
40
30
20
10
0
150 160 170 180 190 200 210 220 230 240 250 260 270
June 1
July 1
Aug. 1
Sept. 1
BASIC
check

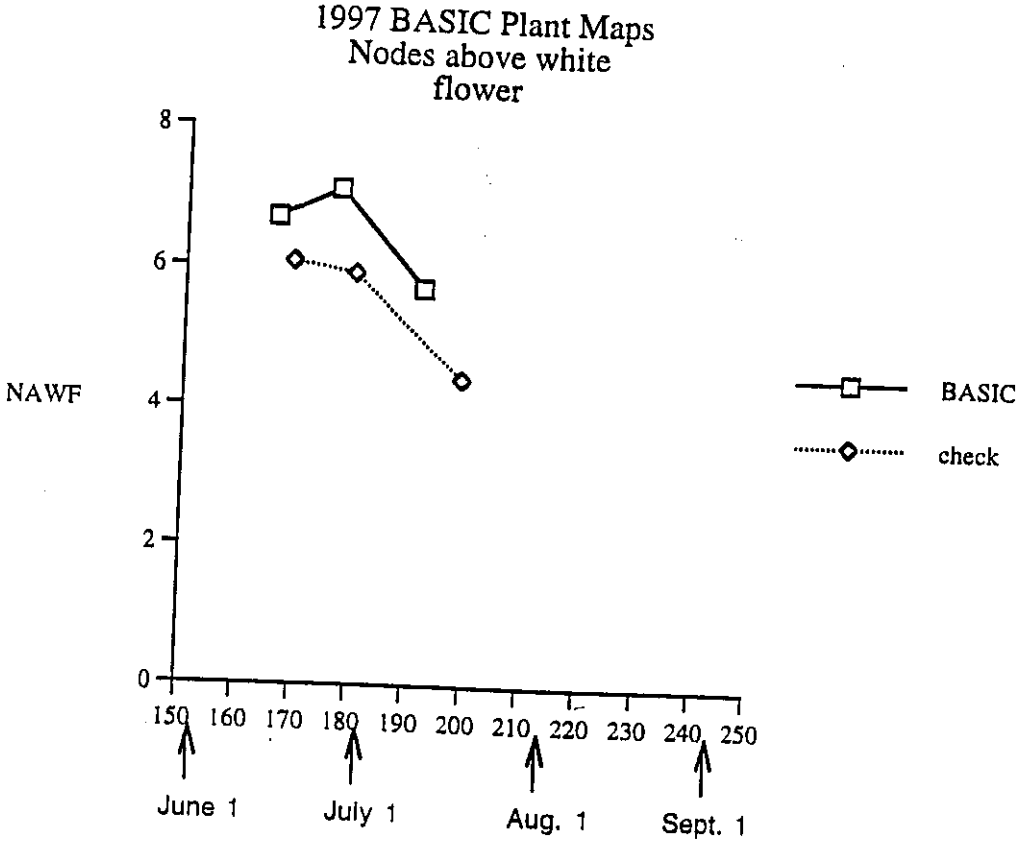
1997 BASIC leaf insects
thrips

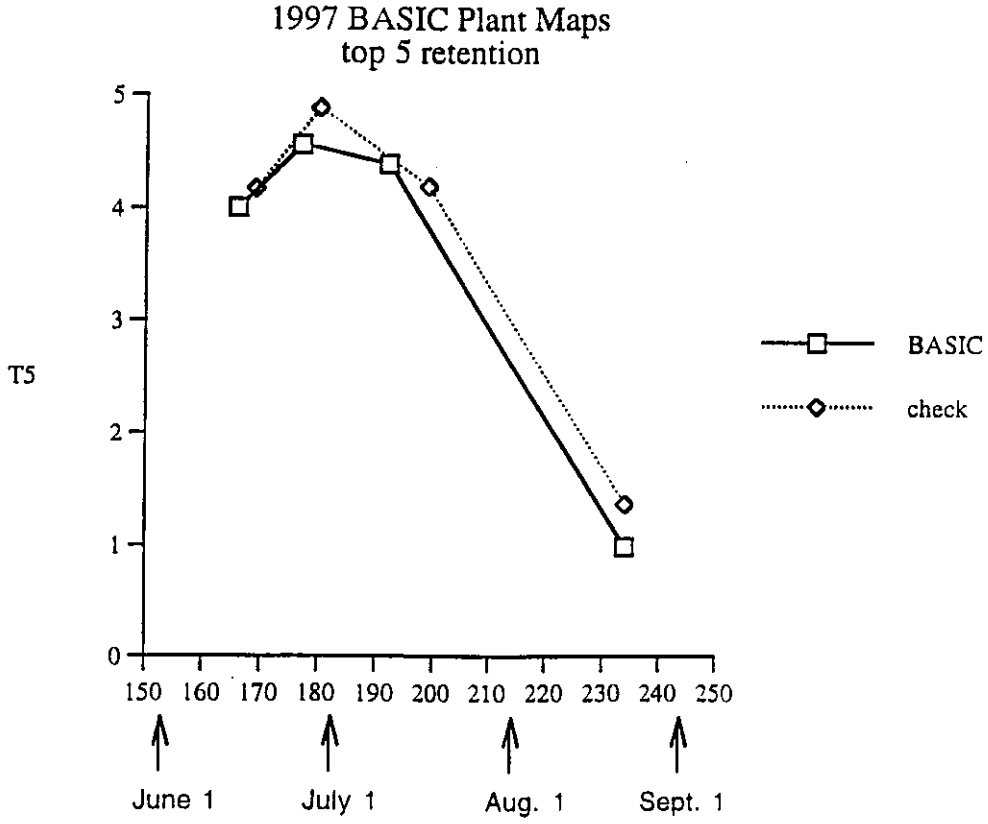


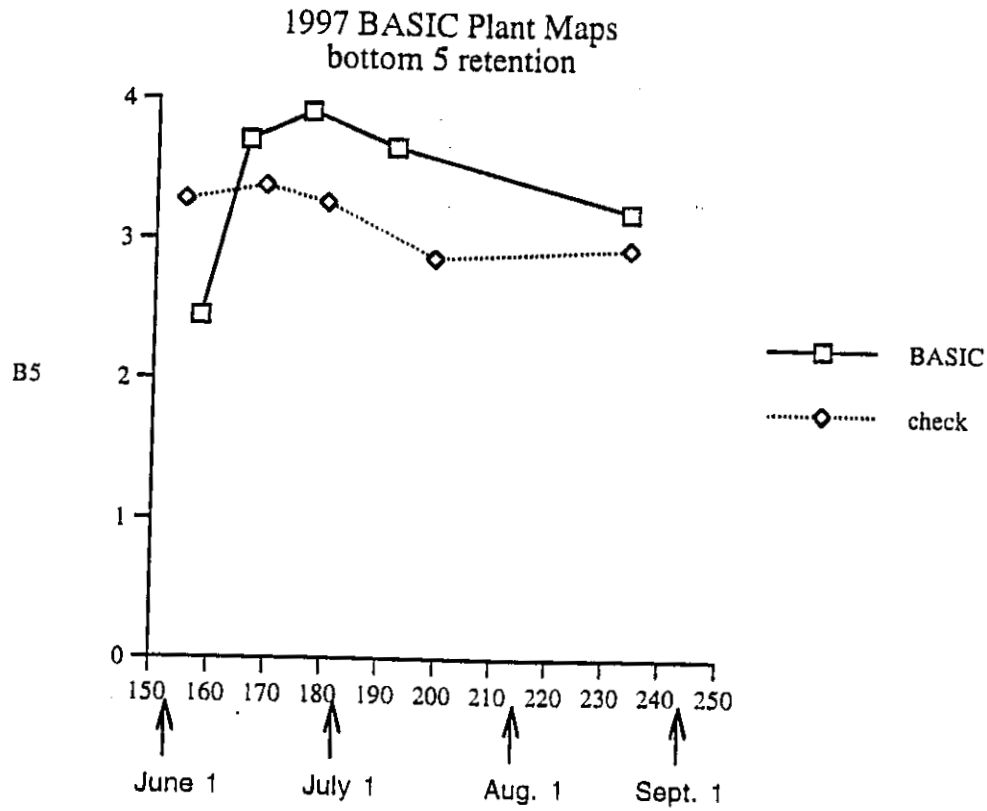

1997 BASIC Plant Maps
nodes
nodes
20
15
10
5
0
150
160
170
180
190
200
210
220
230
240
250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check

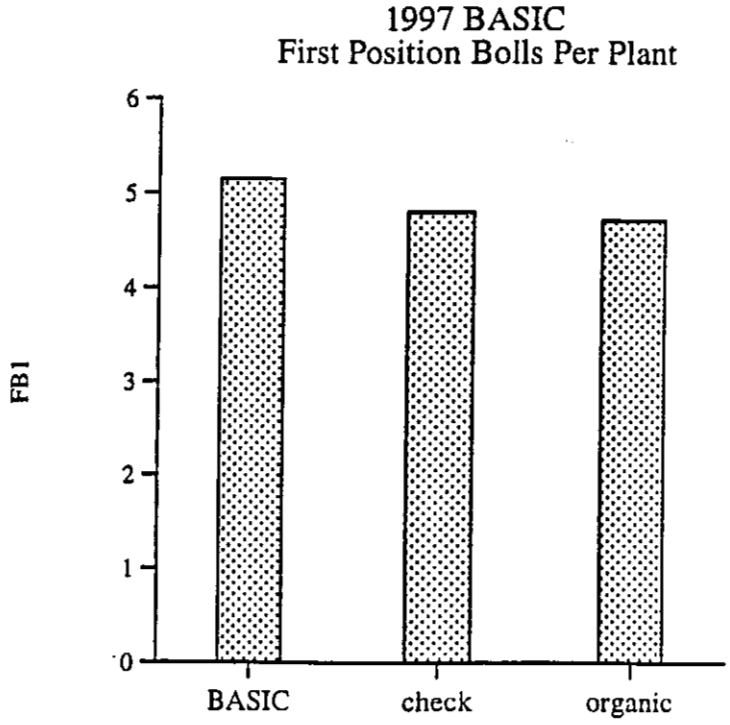

1997 BASIC Plant Maps
vegetative nodes
vegnodes
6
5
4
3
2
1
0
150 160 170 180 190 200 210 220 230 240 250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check

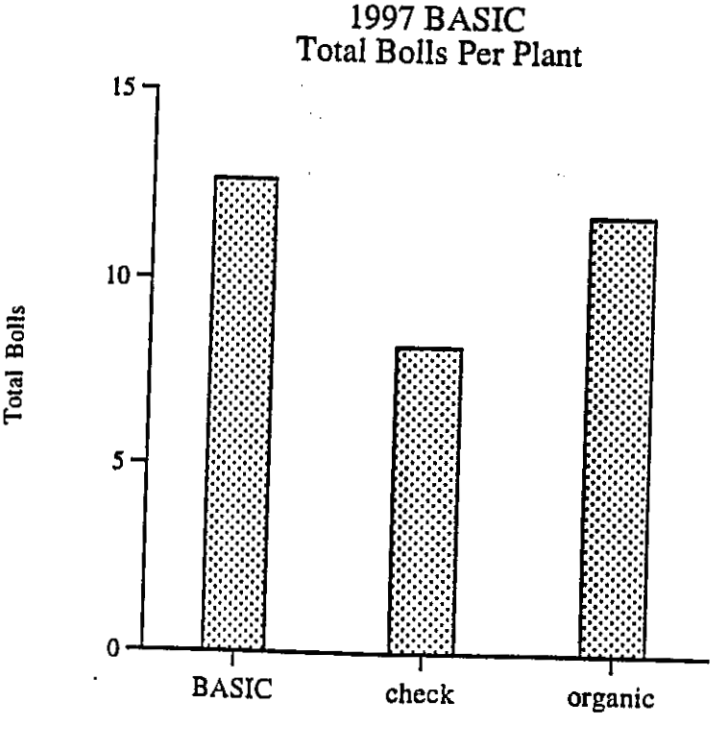

1997 BASIC Plant Maps
Fruiting branches
FB
15
10
5
0
150
160
170
180
190
200
210
220
230
240
250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check

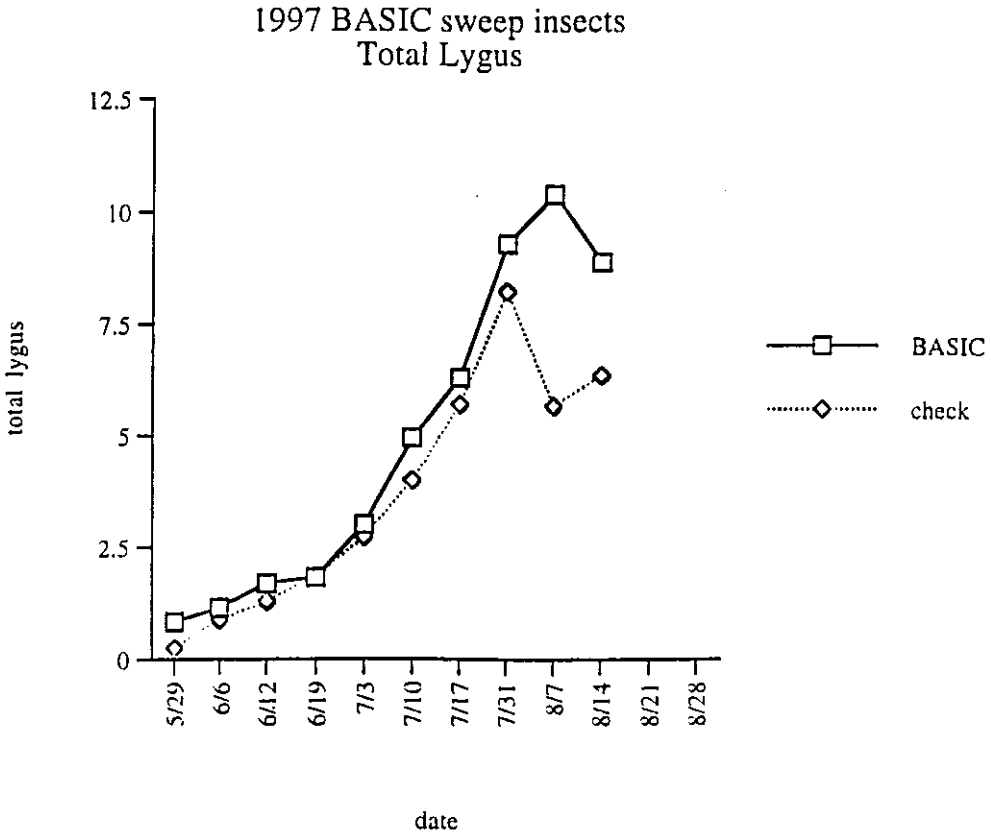

1997 BASIC Plant Maps
Nodes above white flower
NAWF
8
6
4
2
0
150
160
170
180
190
200
210
220
230
240
250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check

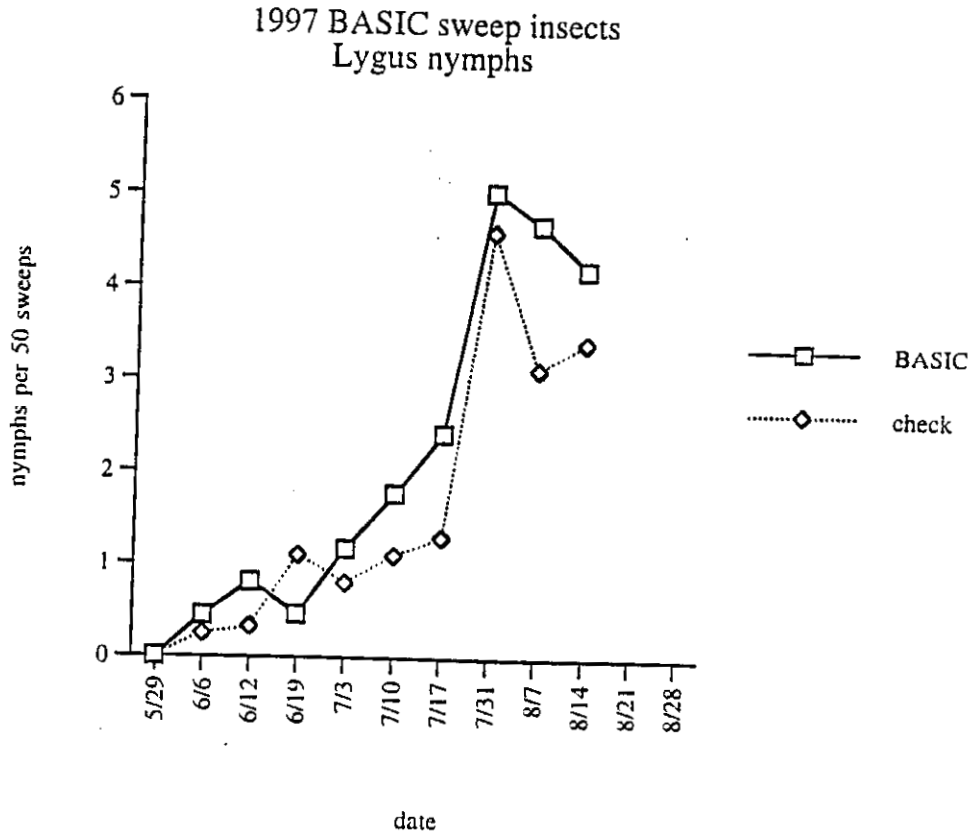

1997 BASIC Plant Maps
top 5 retention
T5
5
4
3
2
1
0
150 160 170 180 190 200 210 220 230 240 250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check

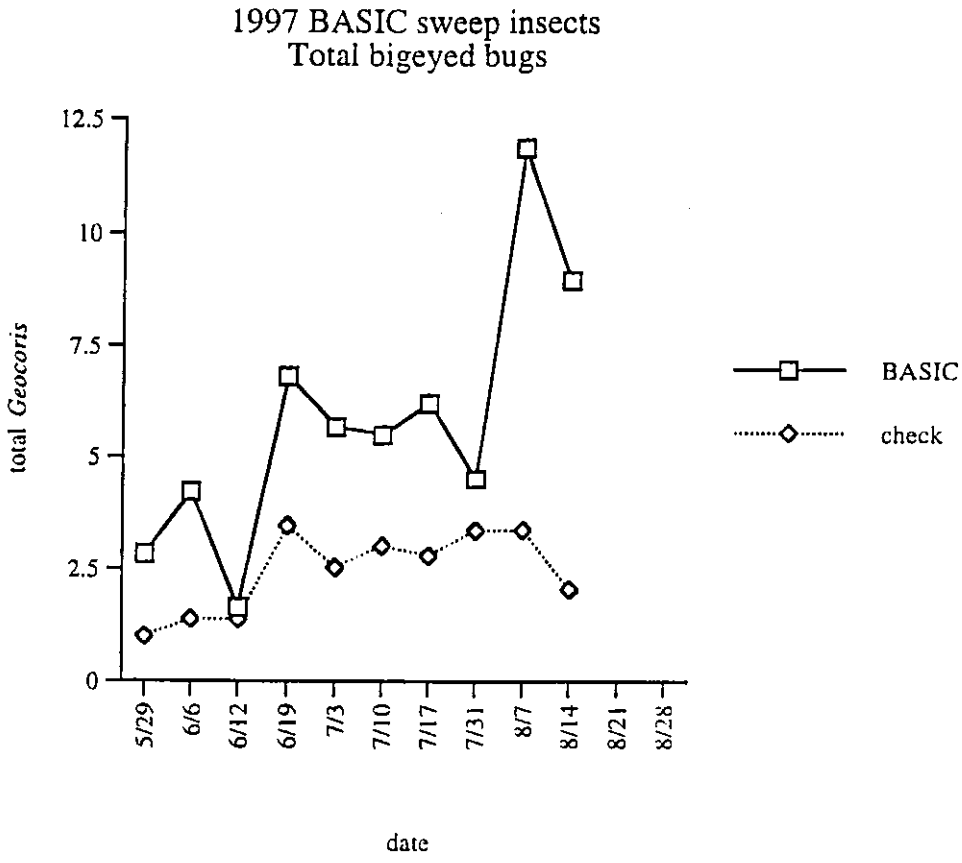

1997 BASIC Plant Maps
bottom 5 retention
B5
4
3
2
1
0
150
160
170
180
190
200
210
220
230
240
250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check

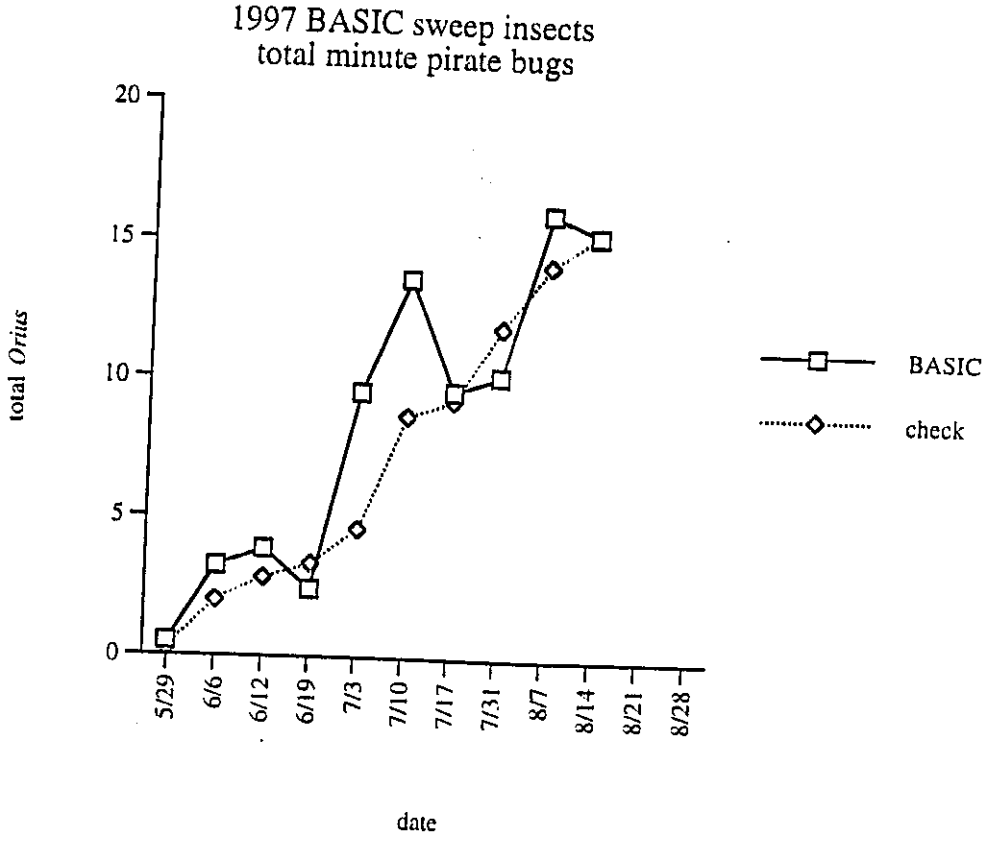

1997 BASIC
First Position Bolls Per Plant
FB1
6
5
4
3
2
1
0
BASIC
check
organic

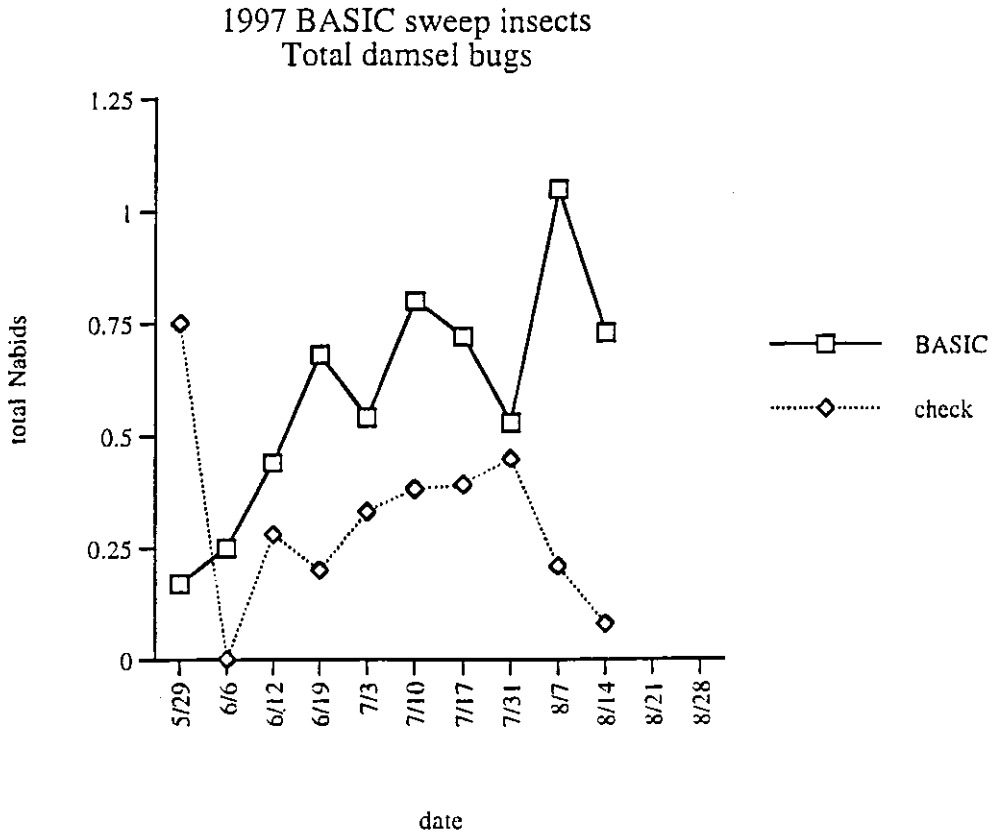

1997 BASIC
Total Bolls Per Plant
Total Bolls
15
10
5
0
BASIC
check
organic

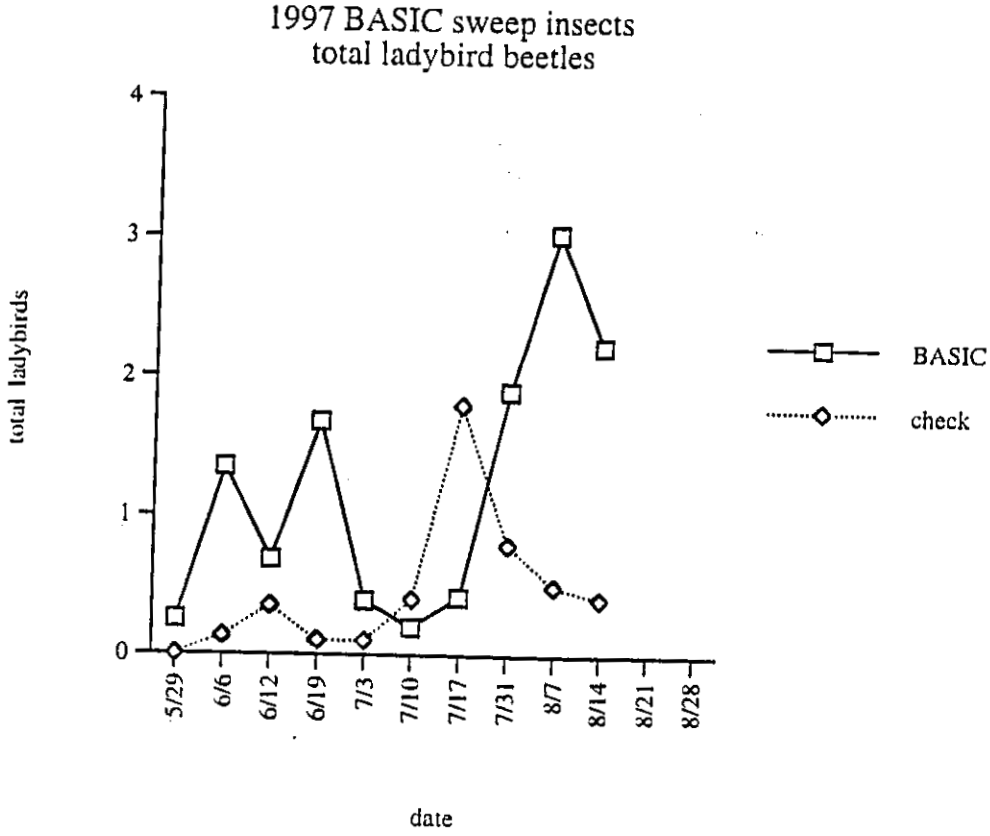

1997 BASIC sweep insects
Total Lygus
12.5
10
7.5
5
2.5
0
total lygus
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

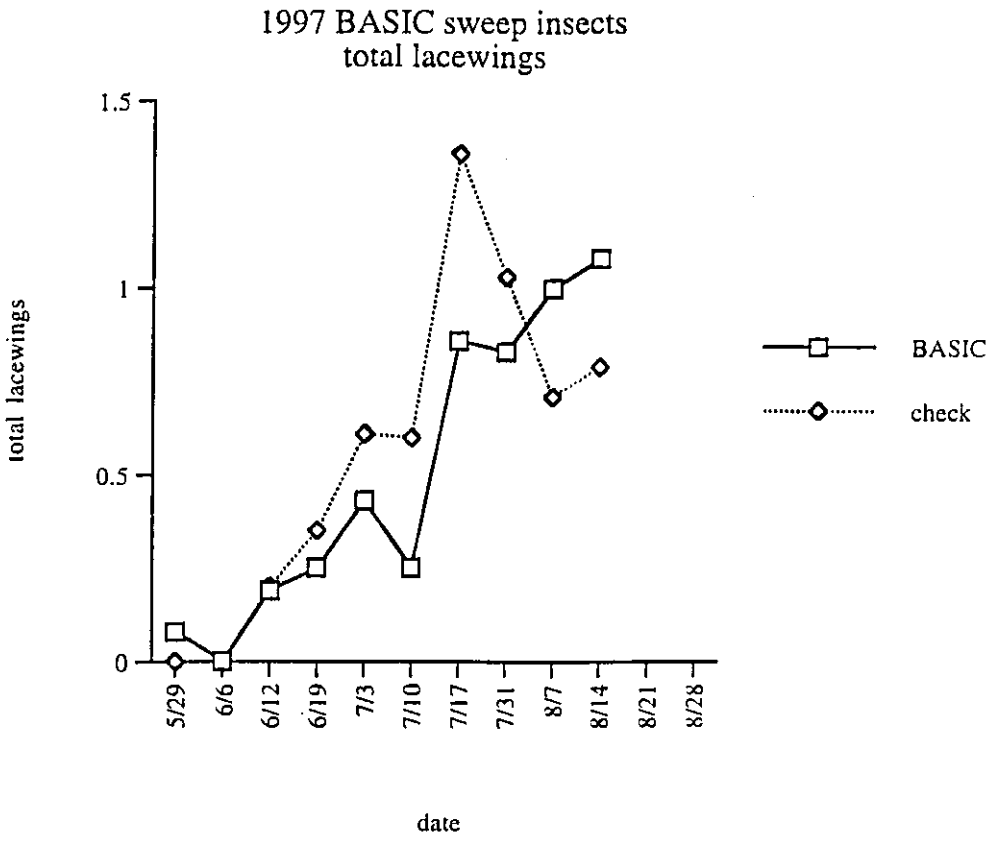

1997 BASIC sweep insects
Lygus nymphs
nymphs per 50 sweeps
0
1
2
3
4
5
6
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

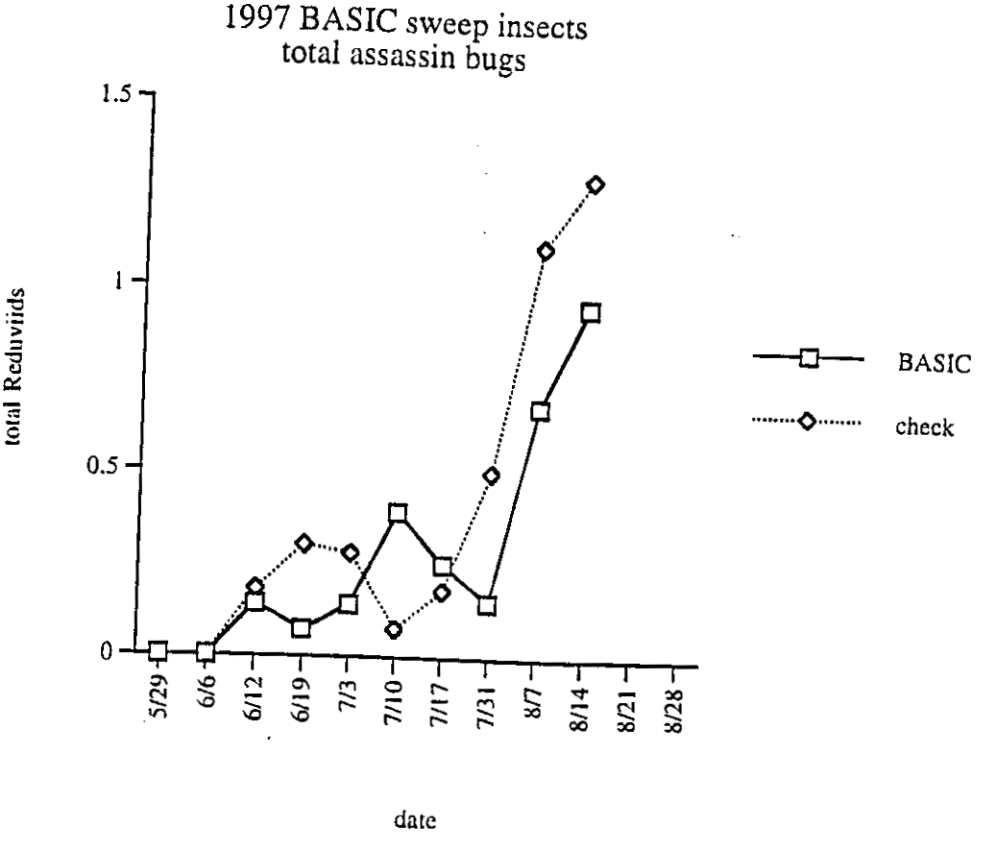

1997 BASIC sweep insects
Total bigeyed bugs
total Geocoris
12.5
10
7.5
5
2.5
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

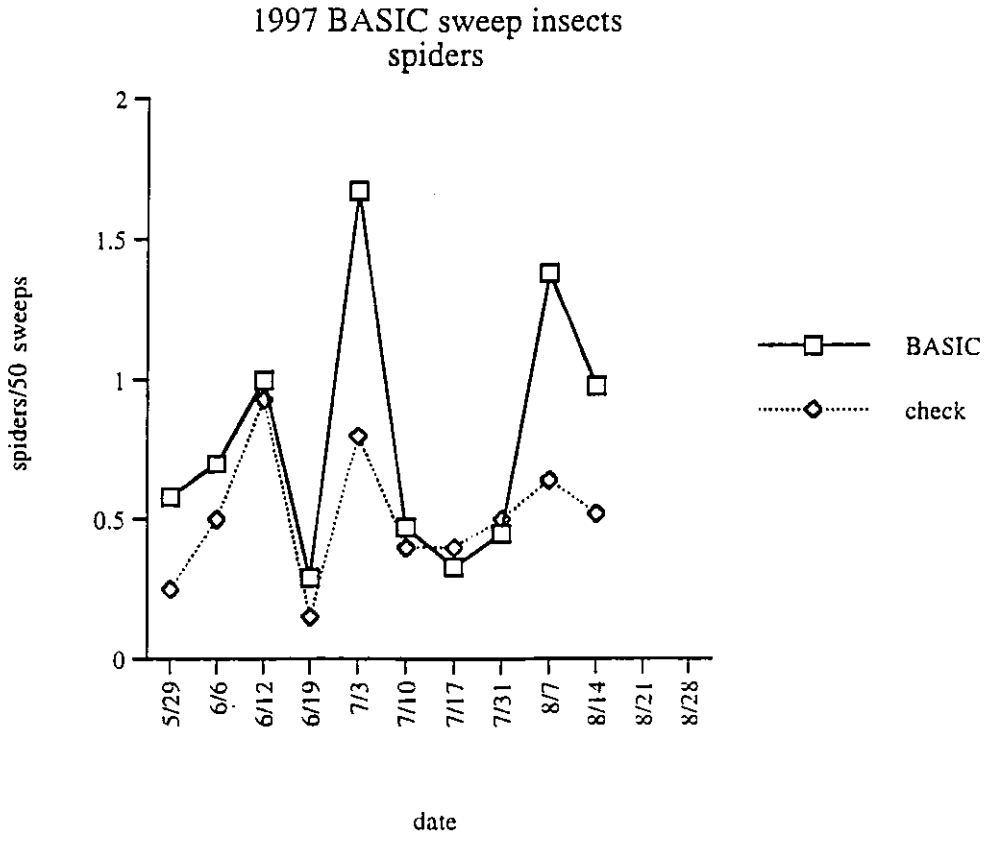

1997 BASIC sweep insects
total minute pirate bugs
total Orius
20
15
10
5
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

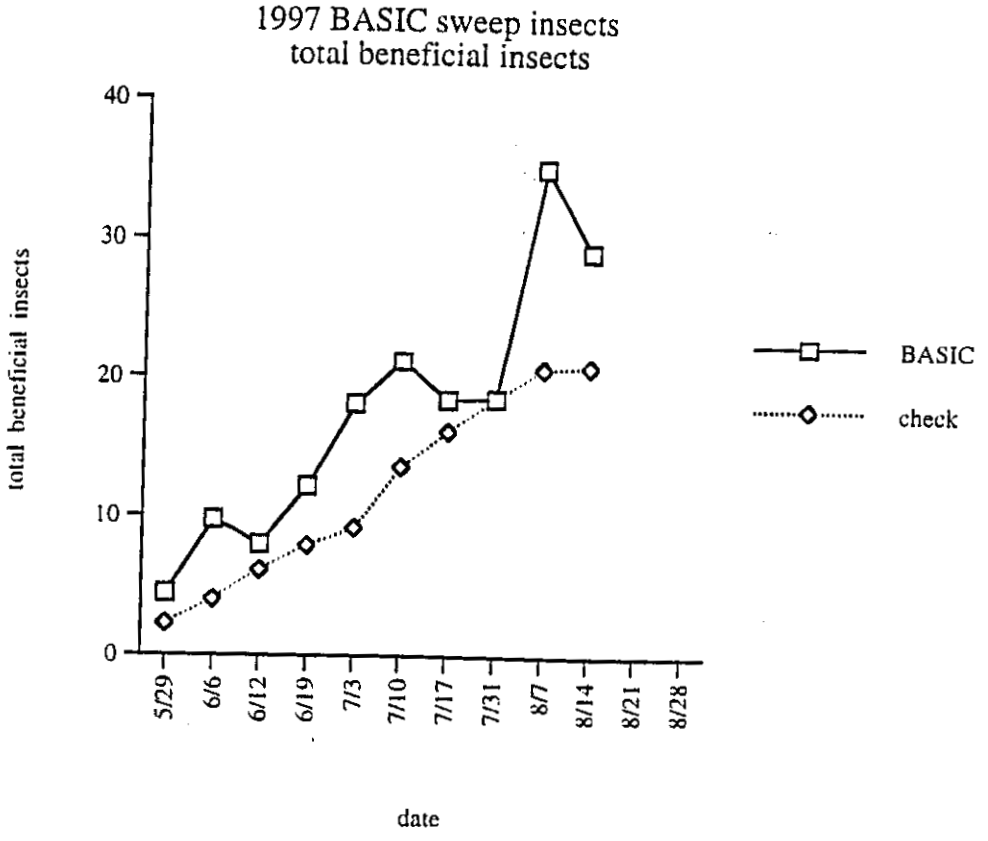

1997 BASIC sweep insects
Total damsel bugs
total Nabids
1.25
1
0.75
0.5
0.25
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

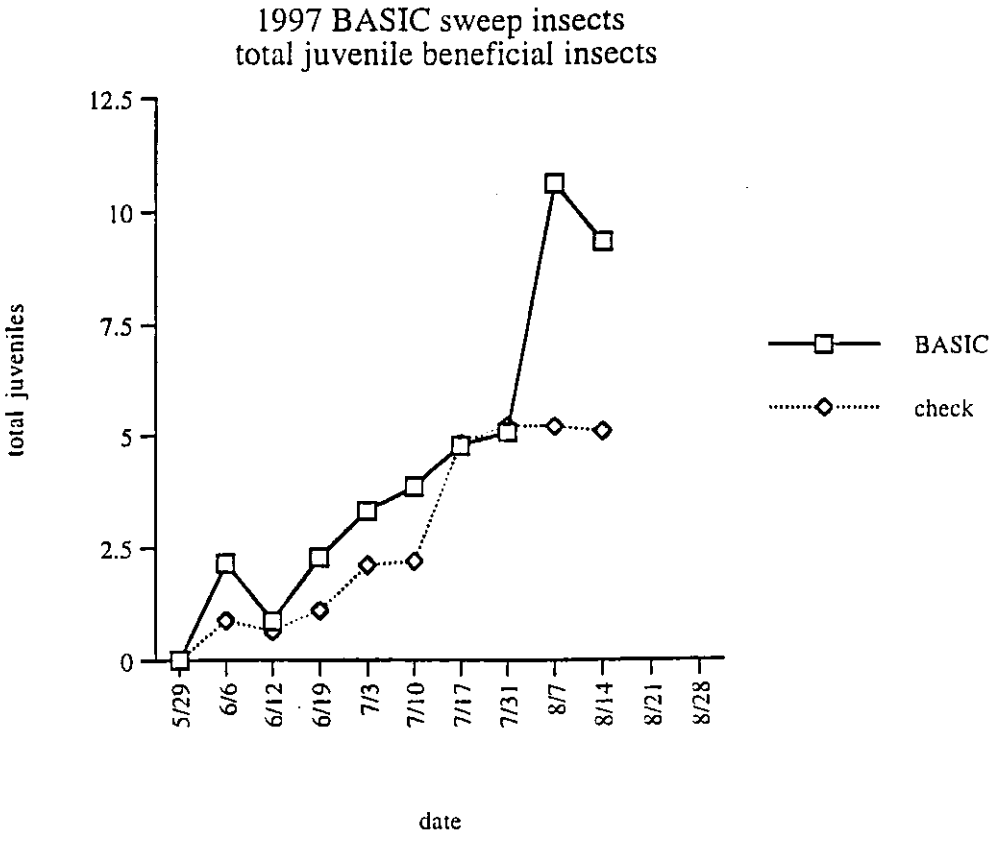

1997 BASIC sweep insects
total ladybird beetles
total ladybirds
4
3
2
1
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

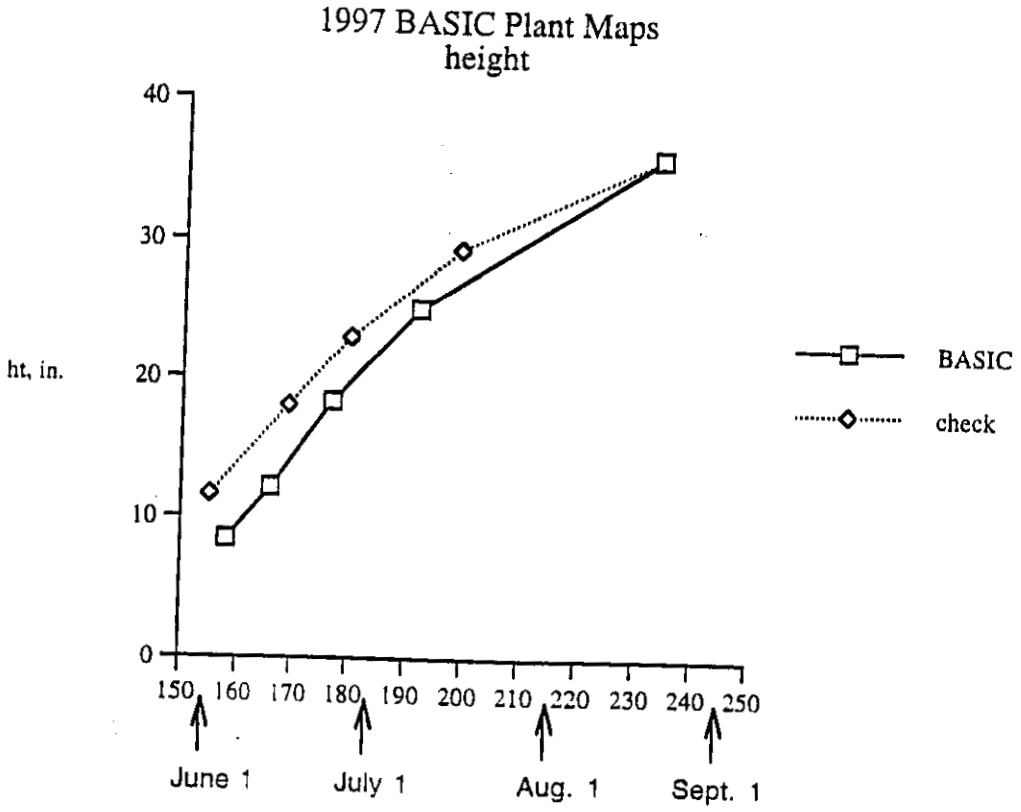

1997 BASIC sweep insects
total lacewings
1.5
1
0.5
0
total lacewings
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

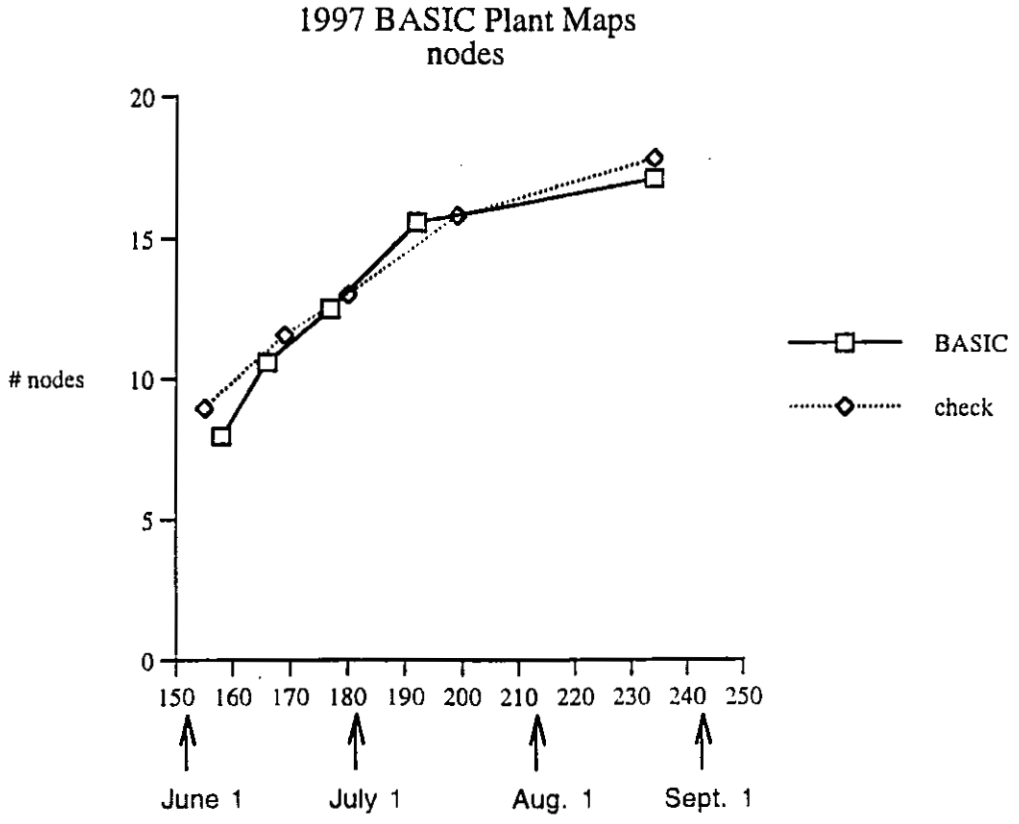

1997 BASIC sweep insects
total assassin bugs
total Reduviids
1.5
1
0.5
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

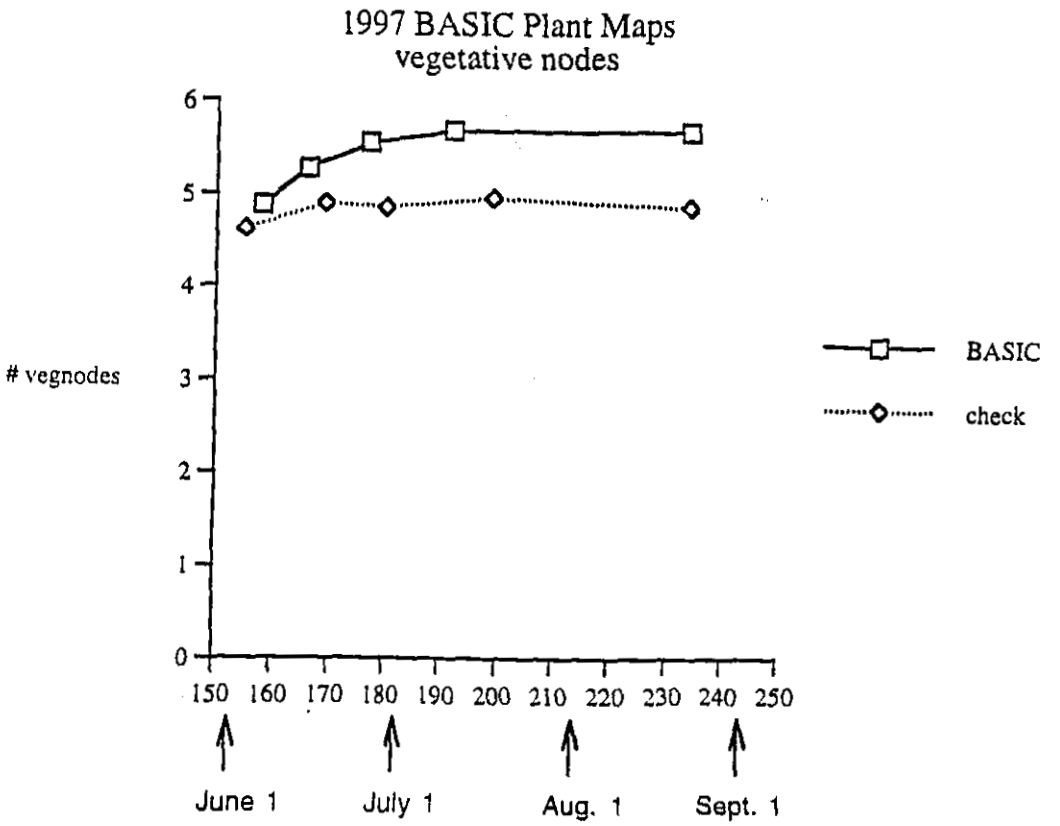

1997 BASIC sweep insects
spiders
spiders/50 sweeps
2
1.5
1
0.5
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

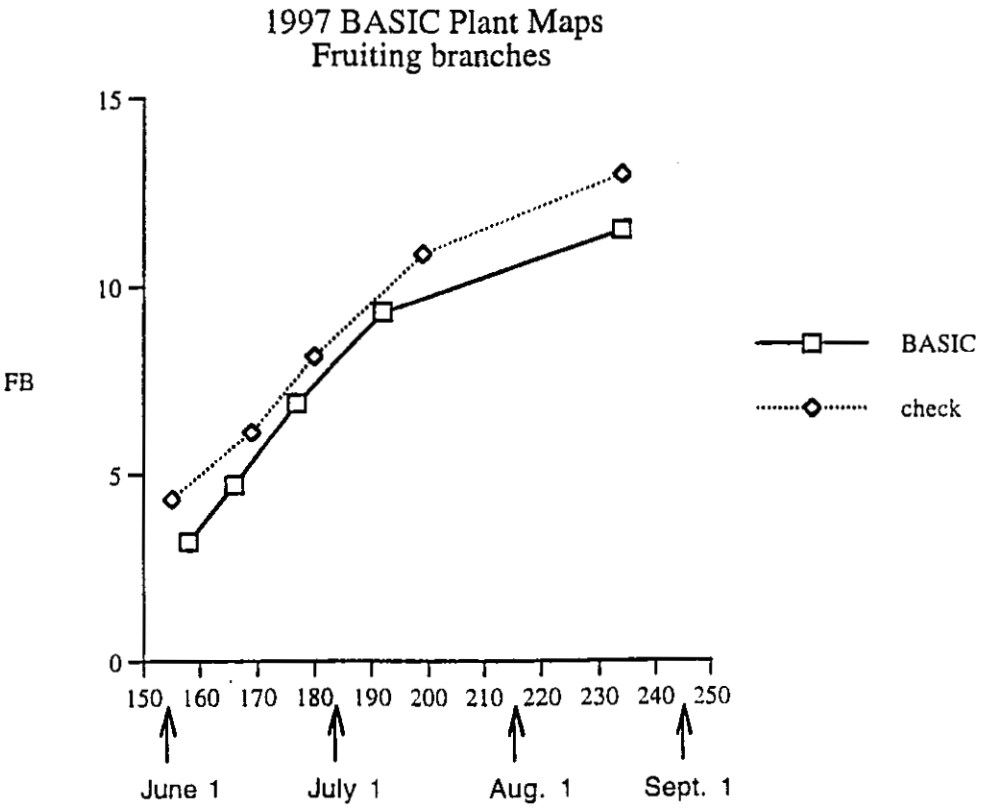

1997 BASIC sweep insects
total beneficial insects
total beneficial insects
40
30
20
10
0
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

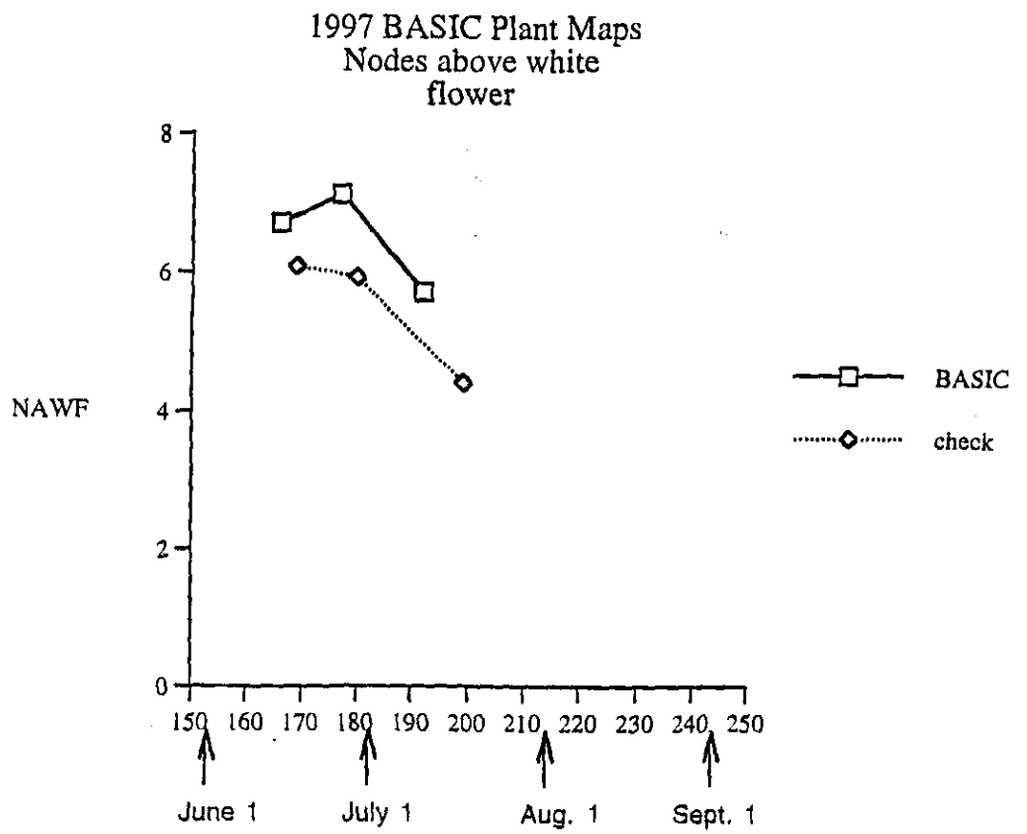

1997 BASIC sweep insects
total juvenile beneficial insects
12.5
10
7.5
5
2.5
0
total juveniles
5/29
6/6
6/12
6/19
7/3
7/10
7/17
7/31
8/7
8/14
8/21
8/28
date
BASIC
check

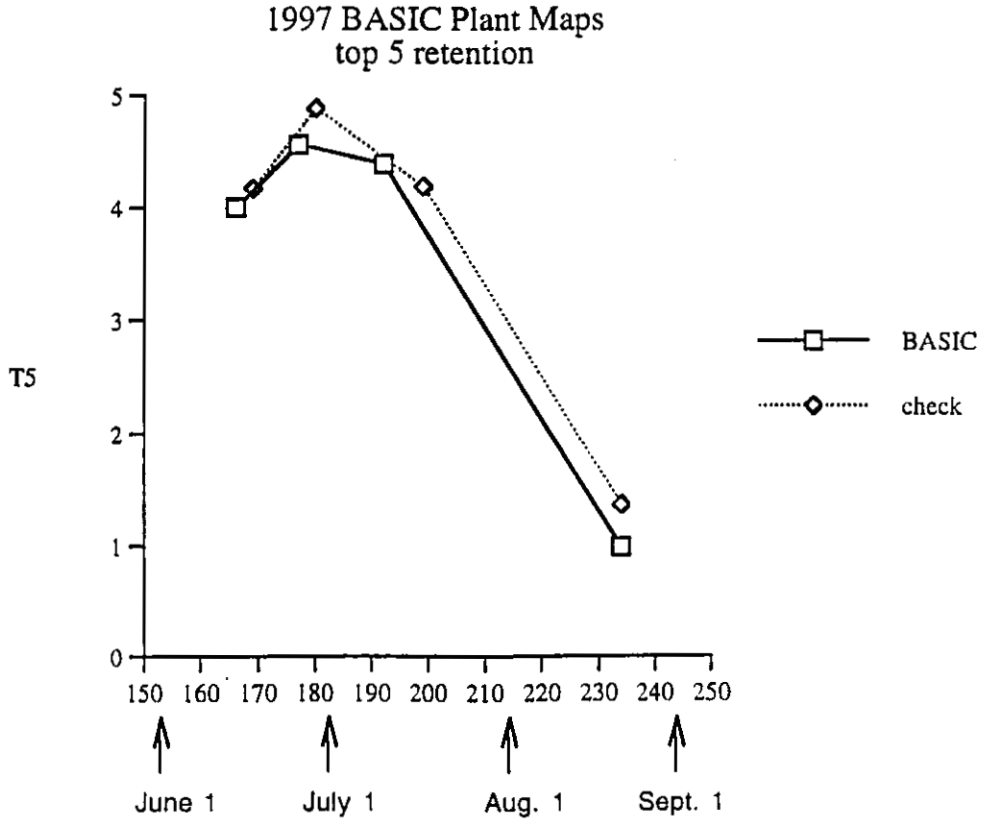

1997 BASIC Plant Maps
height
ht, in.
40
30
20
10
0
150
160
170
180
190
200
210
220
230
240
250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check

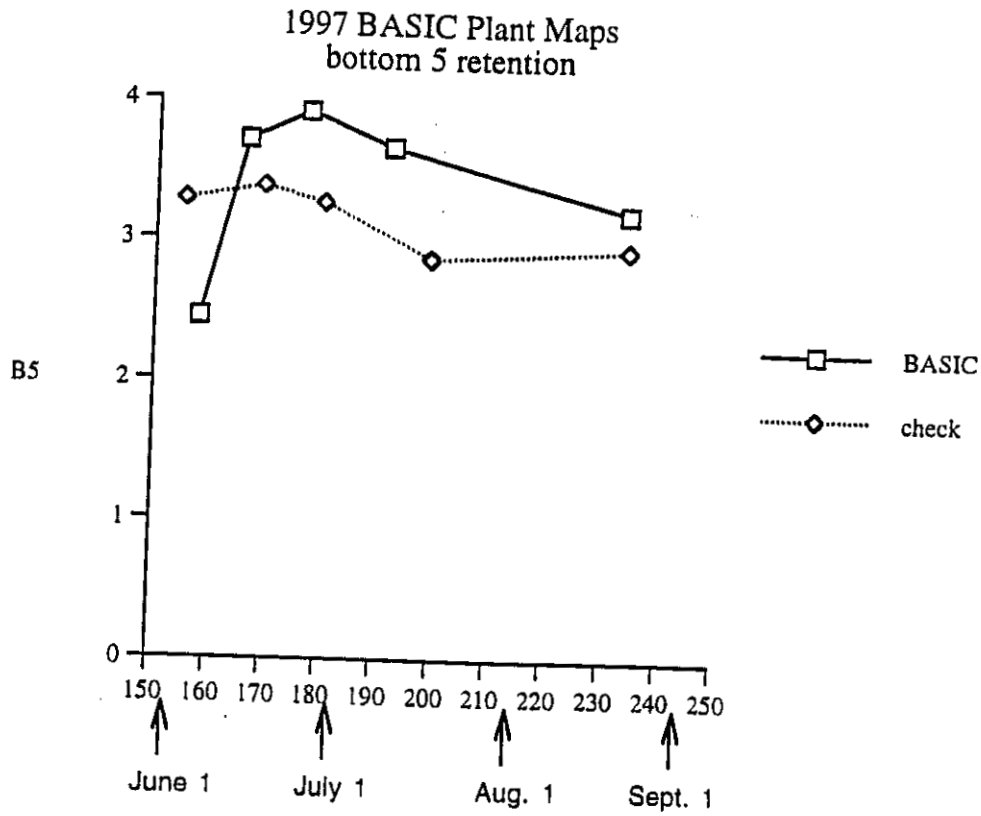

1997 BASIC Plant Maps
nodes
nodes
20
15
10
5
0
150 160 170 180 190 200 210 220 230 240 250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check

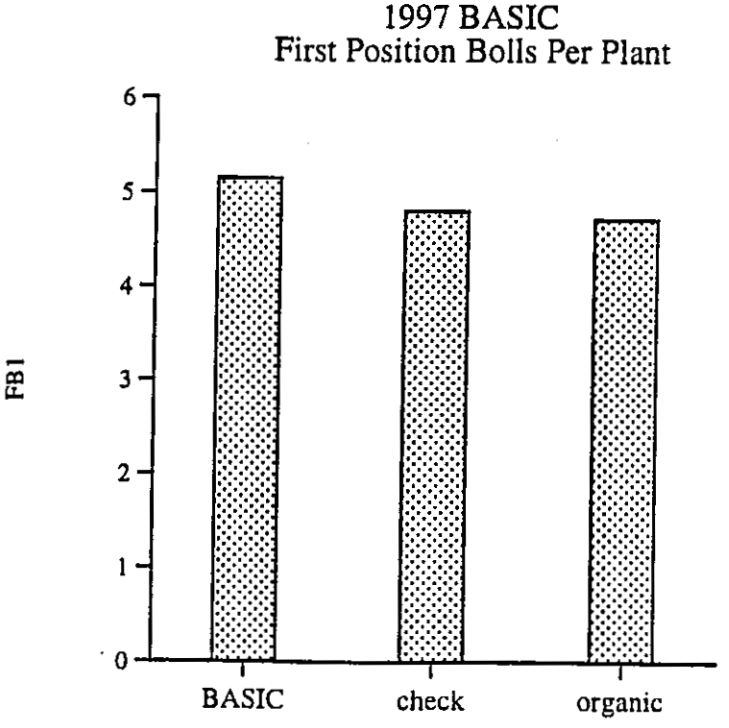

1997 BASIC Plant Maps
vegetative nodes
vegnodes
6
5
4
3
2
1
0
150 160 170 180 190 200 210 220 230 240 250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check

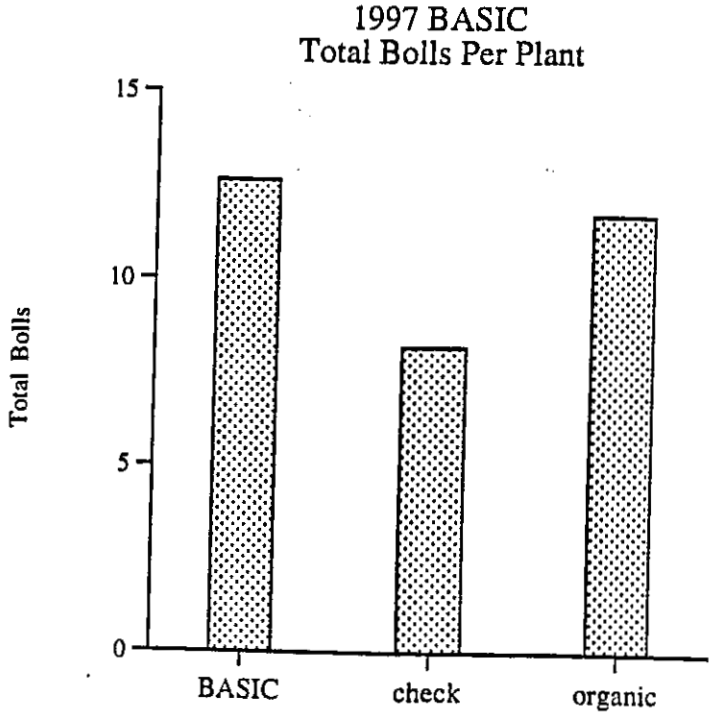

1997 BASIC Plant Maps
Fruiting branches
FB
15
10
5
0
150 160 170 180 190 200 210 220 230 240 250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check


1997 BASIC Plant Maps
Nodes above white flower
NAWF
8
6
4
2
0
150 160 170 180 190 200 210 220 230 240 250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check


1997 BASIC Plant Maps
top 5 retention
T5
5
4
3
2
1
0
150 160 170 180 190 200 210 220 230 240 250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check


1997 BASIC Plant Maps
bottom 5 retention
B5
4
3
2
1
0
150
160
170
180
190
200
210
220
230
240
250
June 1
July 1
Aug. 1
Sept. 1
BASIC
check


1997 BASIC
First Position Bolls Per Plant
FB1
6
5
4
3
2
1
0
BASIC
check
organic


1997 BASIC
Total Bolls Per Plant
Total Bolls
15
10
5
0
BASIC
check
organic